

**Wyoming Department of Health
Summary of Foodborne and Waterborne Diseases
2009 Annual Report**

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Executive Summary

The Wyoming Department of Health Foodborne and Waterborne Disease Surveillance System is a collaborative effort between personnel in Wyoming Department of Health Infectious Disease Epidemiology Program, local health departments, other state agencies, clinical laboratories, and healthcare providers in Wyoming and elsewhere. These groups work together to identify, investigate, and mitigate the effects of foodborne and waterborne diseases in the State of Wyoming.

Data presented in this report were collected by the Wyoming Department of Health Infectious Disease Epidemiology Program through the Reportable Diseases and Conditions surveillance system and through public health case follow-up. The Foodborne and Waterborne Disease Surveillance database contains information on certain reportable foodborne and waterbone diseases and the public health investigations carried out on these disease occurrences. This database contains information regarding the etiology, patient demographics, geographic location, clinical laboratory results, exposure histories, and public health control measures on each reported occurrence. Data were analyzed by state-level epidemiologists and other staff, and additional retrospective case review was performed to verify actual case counts.

This report provides an overview of descriptive epidemiology of certain reportable foodborne and waterborne diseases and conditions from January 1, 2009 to December 31, 2009.

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Methods

Definitions

- Crude incidence rate - Incidence is defined as the number of *new* cases diagnosed during a set time period in a defined population. Incidence is not a representation of risk. Therefore, a crude incidence rate is the number of new cases of a disease within the specified population. A crude incidence rate has not been adjusted for age or other confounding variables. All crude incidence rates in this document are reported as the number of cases per 100,000 population.
- Age-adjusted incidence rate – Statewide age-adjusted rates reported in this document were standardized against the 2000 U.S population using specified age groups and are reported as the number of cases per 100,000 population. County age-adjusted rates reported in this document were standardized against the median population in Wyoming from 2003-2007 (2009 census data was not available at the time of this report) for the specific age group and are also reported as the number of cases per 100,000 population. Age-adjustment allows rates to be compared over time and allows rates from one geographic area (i.e., county) to be compared with rates from another geographic area that may have differences in age distributions. Any observed differences in age-adjusted incidence rates are not due to differing age structures.
- Age-specific incidence rate - An age-specific rate is the rate of disease found within a certain age group. Age-specific incidence rates were calculated using specified age groups and total population (both sexes combined). They are reported per 100,000 population.
- Standardized incidence ratio –The standardized incidence ratio (SIR) is a summary ratio that allows a comparison of incidence rates from a defined population to a standard population. When comparing statewide incidence rates, the 2000 US standard population was used to calculate the SIR. When comparing county incidence rates, the Wyoming standard population (median population from 2003-2007, as 2009 census data was not available) was used to calculate the SIR. It was not possible to calculate the state-level SIR for those diseases that are not nationally reportable due to lack of national summary data. A ratio of 1.00 indicates that the observed number of cases equals the expected number of cases. A ratio above 1.00 indicates that there were more cases observed than expected. Thus, a ratio of 1.25 means that there were 25 percent more observed cases than expected. A ratio below 1.00 indicates that there were fewer observed cases than expected. Therefore, a ratio of 0.85 is interpreted as 15 percent fewer observed cases occurring than expected. The confidence interval of a standardized incidence ratio is interpreted as follows:
 - If the lower number in the confidence interval is less than or equal to 1.00 and the upper number in the interval is greater than or equal to 1.00, there is no statistically significant difference between the number of observed cases and the number of expected cases.
 - If the lower number in the confidence interval is above 1.00, there is a 95 percent probability that a significantly higher number of cases were observed than expected.
 - If the upper number in the confidence interval is less than 1.00, there is a 95 percent probability that significantly fewer cases were observed than expected.

Amoebiasis (*Entamoeba histolytica*)

Case definition

- Confirmed
 - Intestinal amoebiasis:
 - Demonstration of *E. histolytica* cysts or trophozoites in stool, OR
 - Demonstration of trophozoites of *E. histolytica* in tissue biopsy or ulcer scrapings by histopathology or culture
 - Extra-intestinal amoebiasis:
 - Demonstration of trophozoites of *E. histolytica* in extra-intestinal tissue, OR
 - Presence of specific antibody against *E. histolytica* as measured by indirect hemagglutination (IHA) or other reliable immunodiagnostic test such as enzyme linked immunosorbent assay (ELISA), in a symptomatic person with clinical and/or radiological findings consistent with extra-intestinal infection. A positive serologic test in an asymptomatic person does not necessarily indicate extra-intestinal amoebiasis
- Probable[†]
 - Patient with epidemiologic link to a confirmed case and clinically compatible illness

[†]The US Centers for Disease Control and Prevention (CDC) does not define or utilize a definition for “probable” case status. The probable case definition is used by the Wyoming Department of Health solely for surveillance purposes.

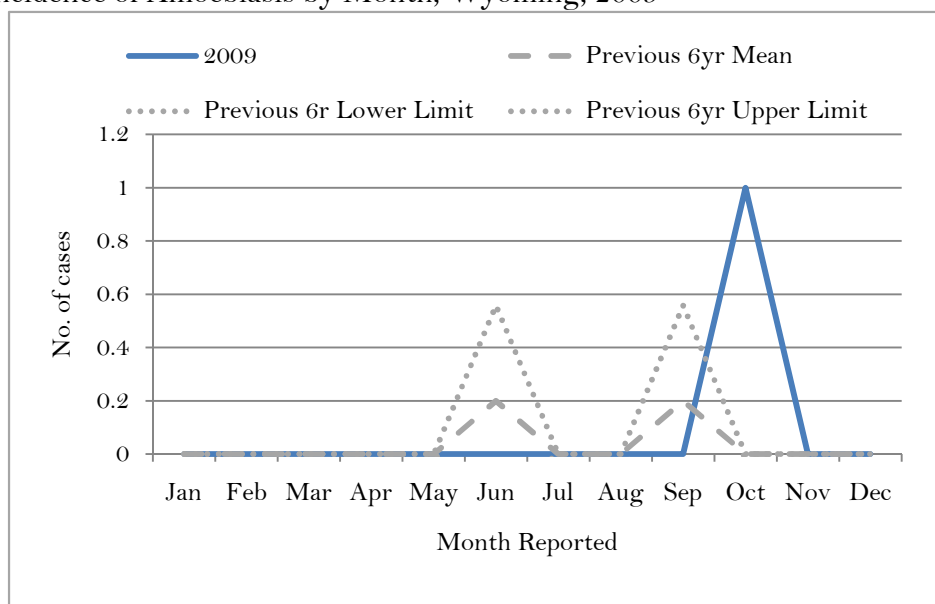
Summary

In 2009, one case of amoebiasis was reported to the WDH Infectious Disease Epidemiology Program (0.22 cases per 100,000 per year). In 2009, Wyoming’s incidence rate for amoebiasis is statistically equivalent to the US incidence rate (US rate: 0.66 cases per 100,000 per year; SIR: 0.34, 95%CI: -0.33-1.02). The single case reported was identified in an infant in Natrona County. Persons aged 0-4 years had the highest crude, age-specific incidence rate (2.84 cases per 100,000 per year). The child likely acquired the infection in a foreign country. Natrona County’s age adjusted incidence rate was 1.48 cases per 100,000 per year, and this rate is not statistically different from the state’s expected rate.

Table 1: Incidence of Amoebiasis by Month and by Status, Wyoming, 2009.

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	0	0	0	0	0	0	0	0	0	1	0	0	1
Probable	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	0	1

Figure 1: Incidence of Amoebiasis by Month, Wyoming, 2009



Outbreaks of Amoebiasis, Wyoming, 2009

The WDH Infectious Disease Epidemiology Program did not investigate any clusters or outbreaks of amoebiasis in 2009.

Botulism (*Clostridium botulinum*)

Case definition

- Foodborne
 - Confirmed - a clinically compatible case that is laboratory confirmed or that occurs among persons who ate the same food as persons who have laboratory-confirmed botulism. Lab-confirmation must include at least one of the following criteria:
 - Detection of botulinum toxin in serum, stool, or patient's food, or
 - Isolation of *Clostridium botulinum* from stool
 - Probable - a clinically compatible case with an epidemiologic link (e.g., ingestion of a home-canned food within the previous 48 hours)
- Infant
 - Confirmed - a clinically compatible case that is laboratory-confirmed, occurring in a child aged less than 1 year. Lab-confirmation must include at least one of the following criteria:
 - Detection of botulinum toxin in stool or serum, or
 - Isolation of *Clostridium botulinum* from stool
- Wound
 - Confirmed - a clinically compatible case that is laboratory confirmed in a patient who has no suspected exposure to contaminated food and who has a history of a fresh, contaminated wound during the 2 weeks before onset of symptoms. Lab-confirmation must include at least one of the following criteria:
 - Detection of botulinum toxin in serum, or
 - Isolation of *Clostridium botulinum* from wound
- Other
 - Confirmed – a clinically compatible case that is laboratory confirmed in a patient aged greater than or equal to 1 year who has no history of ingestion of suspect food and has no wounds. Lab-confirmation must include at least one of the following criteria:
 - Detection of botulinum toxin in clinical specimen, or
 - Isolation of *Clostridium botulinum* from clinical specimen

Summary

In 2009, no cases of botulism were reported to the WDH Infectious Disease Epidemiology Program (0.00 cases per 100,000 per year). The incidence of botulism in Wyoming was equivalent to the US national incidence, which is 0.0 cases per 100,000 per year (SIR: incalculable).

Outbreaks of Botulism, Wyoming, 2009

The WDH Infectious Disease Epidemiology Program did not investigate any clusters or outbreaks of botulism in 2009.

Campylobacteriosis

Case definition

- Confirmed – a case that is laboratory confirmed by isolation of *Campylobacter* bacteria from any clinical specimen
- Probable – a clinically compatible case that is epidemiologically-linked to a laboratory-confirmed case

**This condition is not nationally notifiable.*

Summary

In 2009, 53 cases of campylobacteriosis were reported to the WDH Infectious Disease Epidemiology Program (11.68 cases per 100,000 per year). Of the cases reported, 47 (88.7%) were laboratory-confirmed and six (11.3%) were probable cases (epidemiologically-linked to a confirmed case). The incidence of campylobacteriosis in Wyoming was statistically equivalent to the estimated US incidence (12.7 cases per 100,000 per year) based on CDC FoodNet sites (SIR: 0.89, 95%CI: 0.65-1.12). The median age of cases of campylobacteriosis was 31 years (range: 0-79 years). Persons aged 0-4 years had the highest age-specific incidence rate (25.53 cases per 100,000 per year). Cases were more likely to be male (54.7%) than female (45.3%). While a definitive source of the infection could not be determined in nearly 50% of all cases, contact with animals, especially cattle, foreign travel, and consumption of unpasteurized milk or unpasteurized milk products continue to be frequent sources of *Campylobacter* infection in Wyoming.

Fifteen Wyoming counties reported cases of campylobacteriosis in 2009. Crook County reported the highest age-adjusted incidence rate (24.76 cases per 100,000 per year) but was not statistically greater than the statewide rate. In 2009, no Wyoming counties reported age-adjusted incidence rates that were statistically greater than the expected state rate. Albany (4.48 cases per 100,000 per year), Laramie (2.26 cases per 100,000 per year), Natrona (3.93 cases per 100,000 per year) and Sweetwater (4.87 cases per 100,000 per year) Counties reported cases and had age-adjusted incidence rates statistically lower than the expected state rate. Big Horn, Carbon, Hot Springs, Niobrara, Platte, Sublette, Washakie, and Weston Counties did not report any cases of campylobacteriosis in 2009. All other counties had age-adjusted incidence rates that were statistically equivalent to the statewide incidence rate.

Table 2: Occurrence of Campylobacteriosis by Month Reported and by Status, Wyoming, 2009

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	1	1	2	3	5	10	7	7	2	3	3	3	47
Probable	0	0	0	0	1	2	2	0	0	1	0	0	6
Total	1	1	2	3	6	12	9	7	2	4	3	3	53

Figure 2: Occurrence of Campylobacteriosis by Month, Wyoming, 2009

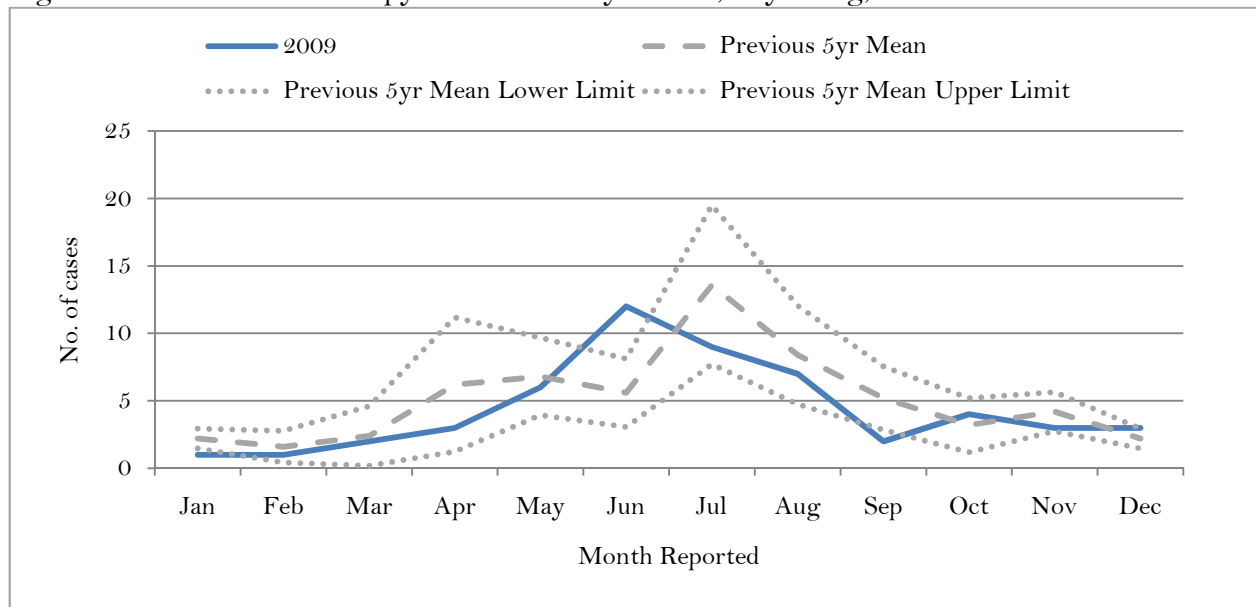
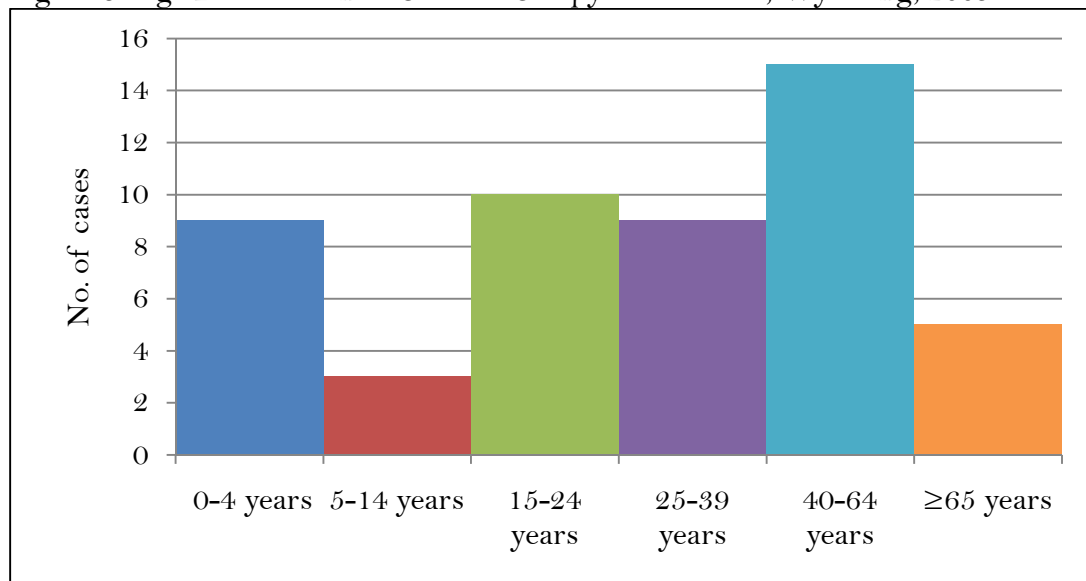


Table 3: Demographics of Case Patients with Campylobacteriosis, Wyoming, 2009

	n(%)
Age	
0-4 years	9 (17.0%)
5-14 years	3 (5.7%)
15-24 years	10 (18.9%)
25-39 years	9 (17.0%)
40-64 years	15 (28.3%)
≥65 years	5 (9.4%)
Unknown	2 (3.8%)
Median age	31 years
Age range	0-79 years
Gender	
Female	24 (45.3%)
Male	29 (54.7%)
Hospitalized	
Yes	5 (9.4%)
No	48 (90.6%)
Unknown	0 (0.0%)
Median no. of days hospitalized	2 days
Range of no. of days hospitalized	2-3 days
Outbreak status	
Outbreak/cluster related	2 (3.8%)

Figure 3: Age Distribution of Cases of Campylobacteriosis, Wyoming, 2009



* Two cases in 2009 had an unknown age.

Table 4: Crude and Age-adjusted Incidence Rates of Campylobacteriosis, Wyoming, 2009

	Total No. of Cases	Crude incidence rate (per 100,000 per year)	Age-adjusted incidence rate (per 100,000 per year)	SIR* (95%CI)
Albany	2	6.11	4.48	0.37 (-0.14-0.88)§
Big Horn	0	0.00	0.00	—
Campbell	6	14.47	13.42	1.11 (0.22-1.99)
Carbon	0	0.00	0.00	—
Converse	1	7.54	5.98	0.49 (-0.47-1.46)
Crook	1	15.49	24.76	2.04 (-1.96-6.05)
Fremont	3	7.87	9.96	0.82 (-0.11-1.75)
Goshen	1	8.28	4.47	0.37 (-0.35-1.09)
Hot Springs	0	0.00	0.00	—
Johnson	1	11.81	15.94	1.31 (-1.26-3.89)
Laramie	1	1.14	2.26	0.19 (-0.18-0.55)§
Lincoln	5	30.06	24.19	2.00 (0.25-3.75)
Natrona	5	6.84	3.93	0.32 (0.04-0.61)§
Niobrara	0	0.00	0.00	—
Park	3	10.88	8.16	0.67 (-0.09-1.44)
Platte	0	0.00	0.00	—
Sheridan	7	24.42	23.82	1.92 (0.50-3.35)
Sublette	0	0.00	0.00	—
Sweetwater	2	5.01	4.87	0.40 (-0.16-0.96)§
Teton	3	13.62	18.68	1.54 (-0.20-3.28)
Uinta	3	14.55	16.59	1.37 (-0.18-2.92)
Washakie	0	0.00	0.00	—
Weston	0	0.00	0.00	—
Total	53	11.68	11.25	0.89 (0.65-1.12)†

*Wyoming state population used as “standard” population when calculating age-adjusted estimates for each county.

† SIR calculated using estimated national incidence rate of 12.70 cases per 100,000 per year.

§ Estimate is statistically different than the expected incidence rate. Estimates of greater than 1.00 indicate incidence is greater than what is expected and estimates less than 1.00 indicate incidence is less than what is expected and that these differences cannot be explained by differences in the age distribution of the population.

Table 5: Clinical Characteristics among Cases of Campylobacteriosis, Wyoming, 2009

	Total, (%)
Had gastrointestinal symptoms	
Yes	48 (90.6%)
No	0 (0.0%)
Unknown	5 (9.4%)
Specimen source (n=47)	
Stool	47 (100.0%)
Blood	0 (0.0%)
Unspecified	0 (0.0%)
Bacterial isolate was confirmed at WPHL* (n=47)	
Yes	35 (66.0%)
No	18 (34.0%)
Species of Campylobacter (N=37)	
<i>C. jejuni</i>	29 (78.4%)
<i>C. coli</i>	4 (10.8%)
<i>C. upsaliensis</i>	1 (2.7%)
<i>C. lari</i>	1 (2.7%)
Untypeable	2 (5.4%)
Received antibiotic	
Yes	29 (54.7%)
No	15 (28.3%)
Unknown	9 (17.0%)

* Wyoming state statute requires clinical laboratories to send confirmed Campylobacter isolates to the Wyoming Public Health Laboratory for confirmation, subtyping and pulsed-field gel electrophoresis analysis.

Table 6: Most Likely Source of Infection among Cases of Campylobacteriosis, Wyoming, 2009.

	Total, (%)
Source not evident	26 (49.1%)
Animal source	15 (28.3%)
Foreign travel	6 (11.3%)
Food source at home	3 (5.7%)
Unpasteurized milk/milk-products	2 (3.8%)
Recreational water	1 (1.9%)
Drinking water	0 (0.0%)
Food source at restaurant or other food venue	0 (0.0%)

Table 7: Frequency of Certain Animal Exposures Reported by Cases of Campylobacteriosis, Wyoming, 2009.

	Total
Contact with dog	34 (64.2%)
Contact with cat	17 (32.1%)
Contact with cattle	16 (30.2%)
Contact with horse	12 (22.6%)
Contact with bird	5 (9.1%)
Contact with sheep	4 (7.6%)
Contact with goat	4 (7.6%)
Contact with pig	1 (1.9%)
Contact with rodent	1 (1.9%)
Contact with reptile	0 (0.0%)
Contact with amphibian	0 (0.0%)

Percentages can add up to more than 100% because case patients can report exposure to more than one of these types of animals.

Table 8: Frequency of Other Exposures among Cases of Campylobacteriosis, Wyoming, 2009.

	Total
Ate at any restaurant	40 (75.5%)
Ate at any fast food restaurant	14 (26.4%)
Consumed water from a private well	21 (39.6%)
Swam in treated water venue	7 (13.2%)
Swam in untreated water venue	10 (18.9%)
Attended daycare	6 (11.3%)
Live with daycare attendee	5 (9.4%)
Out of state travel	12 (22.6%)
International travel	6 (11.3%)

Percentages can add up to more than 100% because case patients can report more than one of these exposures.

Table 9: Frequency of Reported High-Risk Occupations among Cases of Campylobacteriosis, Wyoming, 2009.

	Total
Food-handling employee	3 (5.7%)
Healthcare worker with direct patient contact	3 (5.7%)
Daycare worker	1 (1.9%)

Public health guidelines call for the exclusion of these individuals from their high-risk occupational setting until 48 hours has passed since the last bout of diarrhea or vomiting, whichever occurs last.

Outbreaks of Campylobacteriosis, 2009

The WDH Infectious Disease Epidemiology Program did not investigate any outbreaks of campylobacteriosis in Wyoming in 2009.

Cryptosporidiosis

Case definition

- Confirmed – a case that has clinically compatible illness and is laboratory confirmed by one of the following methods:
 - Organisms identified in stool, intestinal fluid, or tissue samples or biopsy specimens
 - Antigens in stool or intestinal fluid, or
 - Nucleic acid by PCR in stool, intestinal fluid, or tissue samples or biopsy specimens
- Probable – a clinically compatible case that is epidemiologically-linked to a laboratory-confirmed case

Summary

In 2009, 26 cases of cryptosporidiosis were reported to the WDH Infectious Disease Epidemiology Program (5.73 cases per 100,000 per year). Of the cases reported, 24 (92.3%) were laboratory-confirmed and 2 (7.7%) were probable cases (epidemiologically-linked to a confirmed case). The incidence of cryptosporidiosis in Wyoming in 2009 was statistically equivalent to the estimated US incidence (3.7 cases per 100,000 per year) based on CDC National Notifiable Disease Surveillance System (SIR: 1.57, 95%CI: 0.97-2.18). The median age of cases of cryptosporidiosis was 35 years (range: 0-78 years). Persons aged 40-64 years had the highest age-specific incidence rate (9.60 cases per 100,000 per year). Cases were more likely to be female (57.7%) than male (42.3%). A suspected source of infection could not be identified in 61.5% of cases. Recreational water exposure (19.2%) and foreign travel (11.5%) are common sources of exposure.

Big Horn, Carbon, Converse, Crook, Fremont, Johnson, Natrona, Niobrara, Park, Platte, Sheridan, Sublette, Sweetwater, Teton, Uinta, and Washakie Counties did not report any cases of cryptosporidiosis in 2009. Campbell County had the highest age-adjusted incidence rate (40.04 cases per 100,000 per year), which is nearly seven times higher than the state's expected rate. Albany and Laramie Counties had age-adjusted incidence rates that were statistically lower than the states expected rate. Goshen, Hot Springs, Lincoln, and Weston Counties also reported cases of cryptosporidiosis in 2009; the age-adjusted incidence rates in those counties were statistically equivalent to the expected state rate.

Table 10: Occurrence of Cryptosporidiosis by Month Reported and by Status, Wyoming, 2009

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	1	3	2	4	2	1	1	0	3	2	1	4	24
Probable	0	0	0	0	0	0	1	0	0	0	0	1	2
Total	1	3	2	4	2	1	2	0	3	2	1	5	26

Figure 4: Incidence of Cryptosporidiosis by Month Reported, Wyoming, 2009

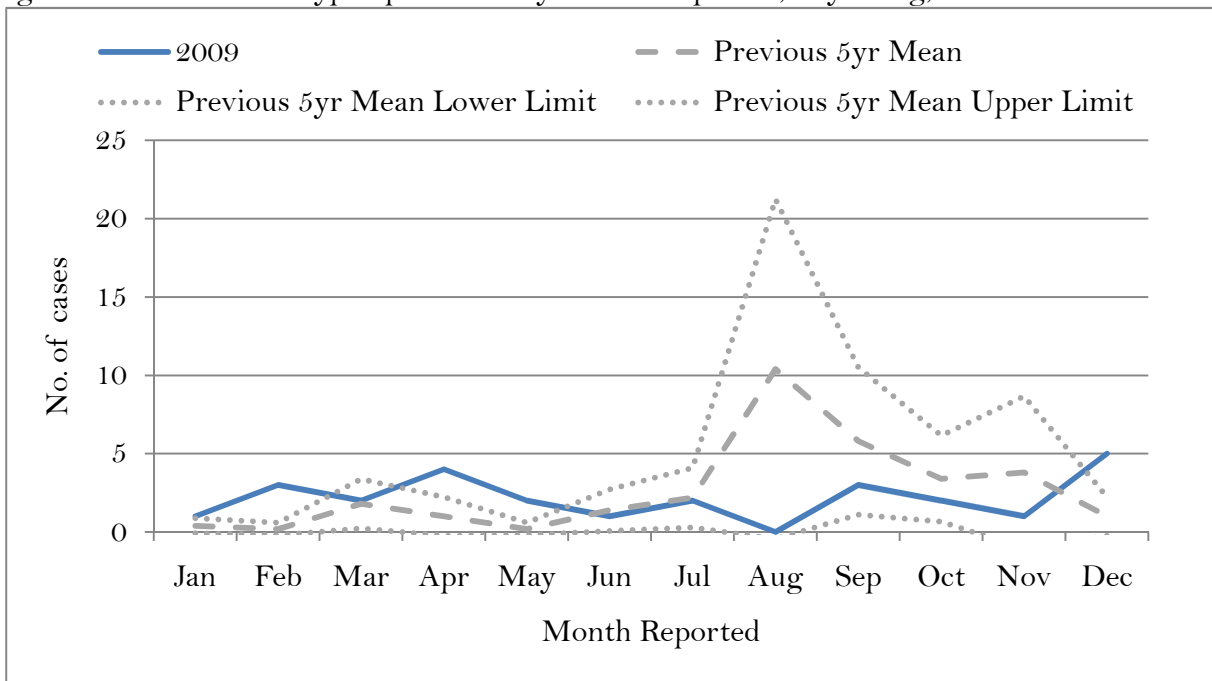


Table 11: Demographics of Case Patients with Cryptosporidiosis (N=26), Wyoming, 2009

		Total n(%)
Age		
0-4 years		3 (11.5%)
5-14 years		0 (0.0%)
15-24 years		4 (15.4%)
25-39 years		7 (26.9%)
40-64 years		11 (42.3%)
≥65 years		1 (3.9%)
Unknown		
Median age		35 yrs
Age range:		0-78 yrs
Gender		
Female		15 (57.7%)
Male		11 (42.3%)
Hospitalized		
Yes		2 (7.4%)
No		24 (88.9%)
Unknown		1 (3.7%)
Median no. of days hospitalized		—
Range of no. of days hospitalized		—
Outbreak status		
Outbreak/cluster related		0 (0.0%)

Figure 5: Age Distribution of Cases of Cryptosporidiosis (N=26), Wyoming, 2009

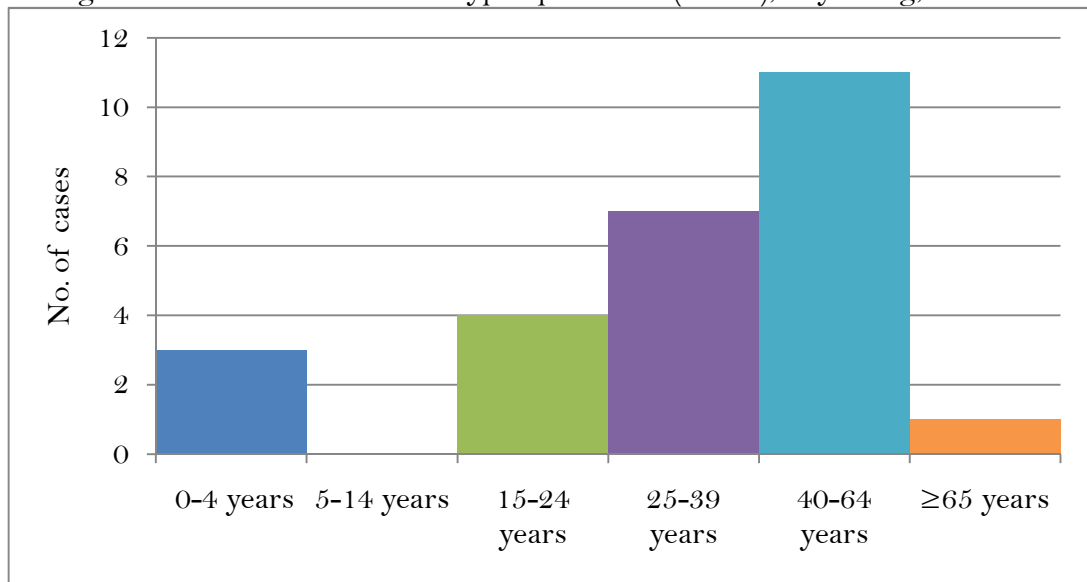


Table 12: Crude and Age-adjusted Incidence of Cryptosporidiosis by County, Wyoming, 2009

	Total No. of Cases	Crude incidence rate (per 100,000 per year)	Age-adjusted incidence rate (per 100,000 per year)	SIR* (95%CI)
Albany	1	3.05	1.42	0.25 (-0.24-0.73)§
Big Horn	0	0.00	0.00	—
Campbell	18	43.40	40.04	6.99 (3.76-10.21)§
Carbon	0	0.00	0.00	—
Converse	0	0.00	0.00	—
Crook	0	0.00	0.00	—
Fremont	0	0.00	0.00	—
Goshen	1	8.28	6.06	1.06 (-1.01-3.13)
Hot Springs	1	21.64	35.40	6.18 (-5.93-18.29)
Johnson	0	0.00	0.00	—
Laramie	1	1.14	0.87	0.15 (-0.15-0.45)§
Lincoln	2	12.03	9.53	1.66 (-0.64-3.97)
Natrona	0	0.00	0.00	—
Niobrara	0	0.00	0.00	—
Park	0	0.00	0.00	—
Platte	0	0.00	0.00	—
Sheridan	0	0.00	0.00	—
Sublette	0	0.00	0.00	—
Sweetwater	0	0.00	0.00	—
Teton	0	0.00	0.00	—
Uinta	0	0.00	0.00	—
Washakie	0	0.00	0.00	—
Weston	1	14.24	28.64	5.00 (-4.80-14.80)
Total	26	5.73	5.72	1.57 (0.97-2.18)†

*Wyoming state population used as “standard” population when calculating age-adjusted estimates for each county.

† SIR calculated using estimated national incidence rate of 3.7 cases per 100,000 per year.

§ Estimate is statistically different than the expected incidence rate. Estimates of greater than 1.00 indicate incidence is greater than what is expected and estimates less than 1.00 indicate incidence is less than what is expected and that these differences cannot be explained by differences in the age distribution of the population.

Table 13: Clinical Characteristics among Cases of Cryptosporidiosis, Wyoming, 2009

	Total, (%)
Had gastrointestinal symptoms	
Yes	24 (92.3%)
No	0 (0.0%)
Unknown	2 (7.7%)
Received antiparasitic treatment	
Yes	17 (65.4%)
No	5 (19.2%)
Unknown	4 (15.4%)

Table 14: Most Likely Source of Infection among Cases of Cryptosporidiosis, Wyoming, 2009.

	Total, (%)
Unknown source	16 (61.5%)
Recreational water	5 (19.2%)
Foreign travel	3 (11.5%)
Animal source	2 (7.7%)
Daycare-associated	0 (0.0%)
Other water	0 (0.0%)
Drinking water	0 (0.0%)
Secondary transmission	0 (0.0%)

Table 15: Frequency of Other Exposures among Cases of Cryptosporidiosis, Wyoming, 2009.

	Total
Ate at any restaurant	18 (69.2%)
Ate at any fast food restaurant	13 (50.0%)
Consumed water from a private well	7 (26.9%)
Swam in treated water venue	10 (38.5%)
Swam in untreated water venue	2 (7.7%)
Attended daycare	1 (3.9%)
Live with daycare attendee	0 (0.0%)
Out of state travel	12 (46.2%)
International travel	3 (11.5%)

Percentages can add up to more than 100% because case patients can report more than one of these exposures.

Table 16: Frequency of Reported High-Risk Occupations among Cases of Cryptosporidiosis, Wyoming, 2009.

	Total
Food-handling employee	1 (3.9%)
Healthcare worker with direct patient contact	1 (3.9%)
Daycare worker	0 (0.0%)

Public health guidelines call for the exclusion of these individuals from their high-risk occupational setting until 48 hours has passed since the last bout of diarrhea or vomiting, whichever occurs last.

Outbreaks of Cryptosporidiosis, Wyoming, 2009

The WDH Infectious Disease Epidemiology Program did not identify or investigate any outbreaks of cryptosporidiosis in 2009.

Cyclosporiasis

Case definition

- Confirmed, symptomatic - a laboratory-confirmed case associated with at least one of the following symptoms, watery diarrhea, loss of appetite, weight loss, abdominal bloating and cramping, increased flatus, nausea, fatigue, and low-grade fever.
Laboratory confirmation is defined as the detection of Cyclospora oocysts:
 - By microscopic examination of stool, intestinal fluid or small bowel biopsy specimens, or
 - By demonstration of sporulation, or
 - By identification of Cyclospora DNA via polymerase chain reaction (PCR) in stool, duodenal/jejuna aspirates or small bowel biopsy specimens
- Confirmed, asymptomatic: a laboratory-confirmed case (via the above described laboratory techniques) associated with none of the above symptoms.

Summary

In 2009, no cases of cyclosporiasis were reported to the WDH Infectious Disease Epidemiology Program (0.00 cases per 100,000 per year). The incidence of cyclosporiasis in Wyoming was statistically equivalent to the estimated US incidence (0.03 cases per 100,000 per year) based on CDC National Notifiable Disease Surveillance System.

Outbreaks of Cyclosporiasis

The WDH Infectious Disease Epidemiology Program did not investigate any outbreaks of cyclosporiasis in 2009.

***Escherichia coli*, shiga toxin-producing (O157:H7, non-O157, or untyped)**

Case definition

- Confirmed – a case that meets the laboratory criteria for diagnosis. When available, O and H antigen serotype characterization should be reported.
 - Isolation of Shiga toxin-producing *Escherichia coli* from a clinical specimen. *Escherichia coli* O157:H7 isolates may be assumed to be Shiga toxin-producing. For all other *E. coli* isolates, Shiga toxin production or the presence of Shiga toxin genes must be determined to be considered STEC.
- Probable
 - A case with isolation of *E. coli* O157 from a clinical specimen, without confirmation of H antigen or Shiga toxin production, or
 - A clinically compatible case that is epidemiologically linked to a confirmed or probable case, or
 - Identification of an elevated antibody titer to a known Shiga toxin-producing *E. coli* serotype from a clinically compatible case
- Suspect
 - A case of postdiarrheal HUS or TTP, or
 - Identification of Shiga toxin in a specimen from a clinically compatible case without the isolation of the Shiga toxin-producing *E. coli*.

**The case definition for STEC changed in 2000 to include all types of shiga-toxin producing E. coli infections, not just infections caused by E. coli O157:H7. The case definition changed again in 2005 to include classification for the identification of the shiga-toxin in the presence or absence of isolation of the bacteria.*

Summary

In 2009, fifteen cases of shiga-toxin producing *Escherichia coli* (STEC) were reported to the WDH Infectious Disease Epidemiology Program (3.31 cases per 100,000 per year). Of the cases reported, twelve (80.0%) were laboratory-confirmed, one (6.7%) was probable (epidemiologically-linked to a confirmed case), and two (13.3%) were suspect cases (shiga toxin positive without isolation of the bacteria). The incidence of STEC in Wyoming in 2009 was statistically greater than the estimated US incidence (1.12 cases per 100,000 per year) based on CDC National Notifiable Disease Surveillance System (SIR: 2.99, 95%CI: 1.48-4.51). The median age of cases of STEC was ten years (range: 2-66 years). Persons aged 0-4 years had the highest age-specific incidence rate (11.34 cases per 100,000 per year). Cases were more likely to be male (60.0%) than female (40.0%). A definitive source of infection was not found for two-thirds (66.7%) of all cases.

Big Horn, Campbell, Carbon, Converse, Crook, Hot Springs, Johnson, Niobrara, Park, Sublette, Uinta, Washakie, and Weston Counties did not report any cases of STEC in 2009. Platte County reported the highest age-adjusted incidence rate (19.89 cases per 100,000 per year); however this difference was not statistically significant due to a small number of cases being reported. Fremont, Goshen, Laramie, Lincoln, Sheridan, Sweetwater and Teton Counties reported cases in 2009, and the age-adjusted incidence rates in those counties were statistically equivalent with the expected state rate. The incidence of STEC in Natrona County was statistically lower than the states expected rate.

Table 17: Occurrence of Shiga toxin-producing *E. coli* Infections, Wyoming, 2009

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	1	0	0	0	0	0	4	2	2	1	1	1	12
Probable	0	0	0	0	0	0	0	1	0	0	0	0	1
Suspect	0	0	0	0	0	1	0	0	1	0	0	0	2
Total	1	0	0	0	0	1	4	3	3	1	1	1	15

Figure 6: Incidence of Shiga-Toxin Producing *Escherichia coli* Infections (O157:H7, non-O157, or untyped) by Month Reported, Wyoming, 2009

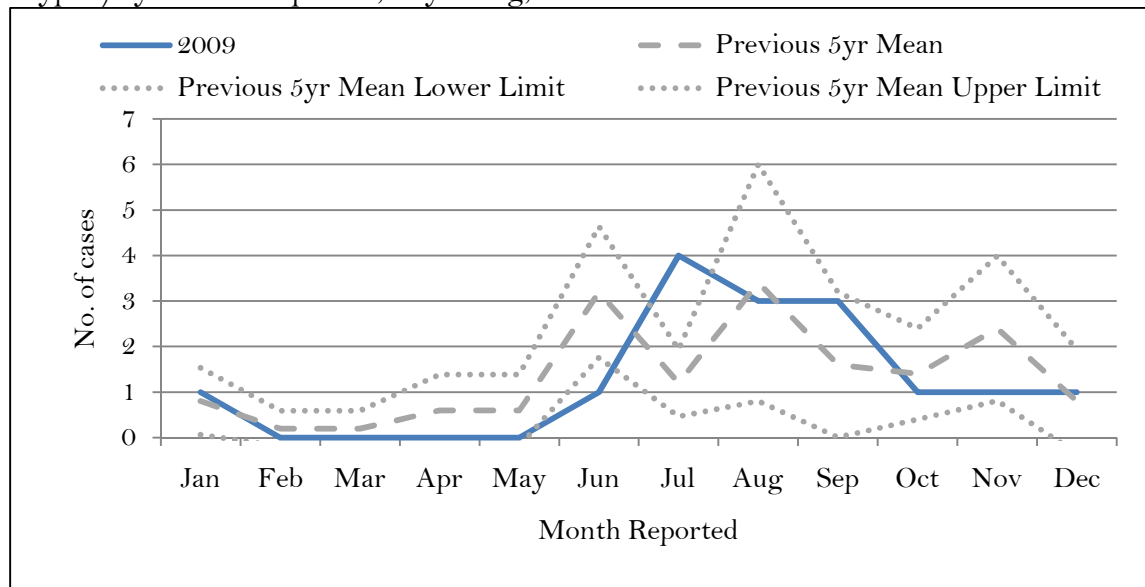


Table 18: Demographics of Case Patients with Shiga-Toxin Producing *Escherichia coli* Infections (O157:H7, non-O157, or untyped) (N=15), Wyoming, 2009

	Total n(%)
Age	
0-4 years	4 (26.7%)
5-14 years	4 (26.7%)
15-24 years	4 (26.7%)
25-39 years	1 (6.7%)
40-64 years	1 (6.7%)
≥65 years	1 (6.7%)
Unknown	0 (0.0%)
Median age	10 yrs
Age range:	2-66 yrs
Gender	6 (40.0%)
Female	9 (60.0%)
Male	
Hospitalized	
Yes	4 (26.7%)
No	11 (73.3%)
Unknown	0 (0.0%)

Median no. of days hospitalized	12 days
Range of no. of days hospitalized	12 days
Outbreak status	
Outbreak/ cluster related	2 (13.3%)

Figure 7: Age Distribution of Cases of Shiga-Toxin Producing *Escherichia coli* (O157:H7, non-O157, or untyped), Wyoming, 2009

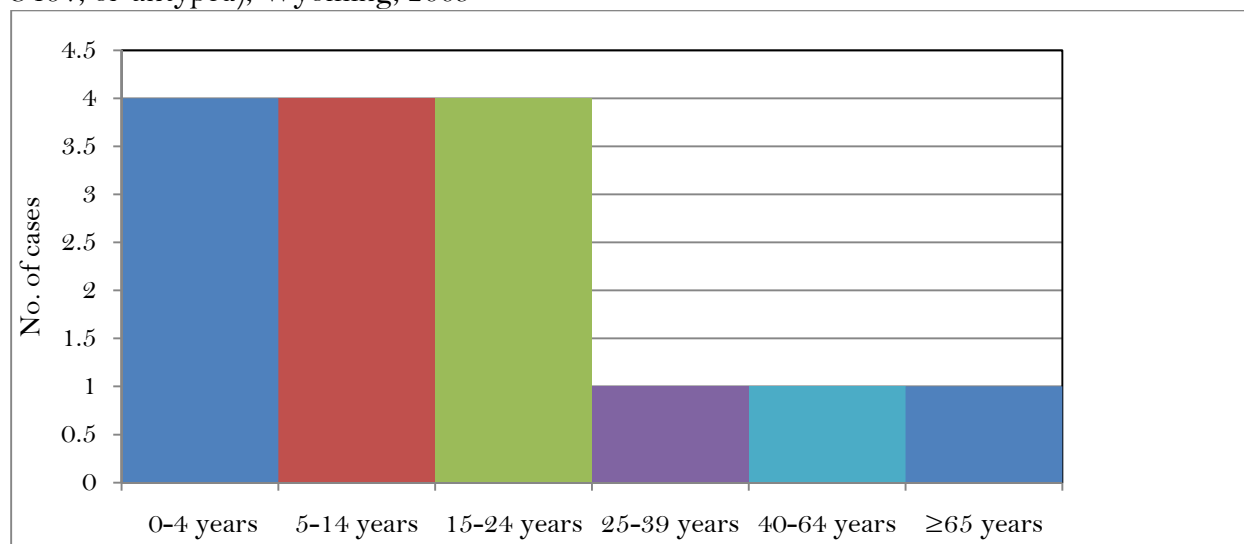


Table 19: Crude and Age-adjusted Incidence of Shiga-Toxin Producing *Escherichia coli* (O157:H7, non-O157, or untyped) by County, Wyoming, 2009

	Total No. of Cases	Crude incidence rate (per 100,000 per year)	Age-adjusted incidence rate (per 100,000 per year)	SIR* (95%CI)
Albany	3	9.16	8.38	2.53 (-0.33-5.40)
Big Horn	0	0.00	0.00	—
Campbell	0	0.00	0.00	—
Carbon	0	0.00	0.00	—
Converse	0	0.00	0.00	—
Crook	0	0.00	0.00	—
Fremont	1	2.62	3.57	1.08 (-1.04-3.19)
Goshen	1	8.28	12.46	3.76 (-3.61-11.14)
Hot Springs	0	0.00	0.00	—
Johnson	0	0.00	0.00	—
Laramie	1	1.14	1.50	0.45 (-0.43-1.34)
Lincoln	1	6.01	5.85	1.77 (-1.70-5.23)
Natrona	1	1.37	1.10	0.33 (-0.32-0.99)§
Niobrara	0	0.00	0.00	—
Park	0	0.00	0.00	—
Platte	1	12.06	19.89	6.01 (-5.77-17.79)
Sheridan	3	10.47	11.08	3.35 (-0.44-7.14)

Sublette	0	0.00	0.00	—
Sweetwater	2	5.01	5.71	1.72 (-0.67-4.11)
Teton	1	4.54	7.82	2.36 (-2.27-6.99)
Uinta	0	0.00	0.00	—
Washakie	0	0.00	0.00	—
Weston	0	0.00	0.00	—
Total	15	3.31	3.35	2.99 (1.48-4.51)†§

*Wyoming state population used as “standard” population when calculating age-adjusted estimates for each county.

†SIR calculated using estimated national incidence rate of 1.12 cases per 100,000 per year.

§ Estimate is statistically different than the expected incidence rate. Estimates of greater than 1.00 indicate incidence is greater than what is expected and estimates less than 1.00 indicate incidence is less than what is expected and that these differences cannot be explained by differences in the age distribution of the population.

Table 20: Clinical Characteristics among Cases of Shiga-Toxin Producing *Escherichia coli* (O157:H7, non-O157, or untyped), Wyoming, 2009

	Total, (%)
Had gastrointestinal symptoms	
Yes	13 (86.7%)
No	0 (0.0%)
Unknown	2 (13.3%)
Specimen source	
Stool	14 (92.9%)
Blood	0 (0.0%)
Urine	1 (7.1%)
Bacterial isolate was confirmed at WPHL*	
Yes	11 (73.3%)
No	4 (26.7%)
E. coli subtypes (N=11)	
O157:H7	7 (63.6%)
O26:H11	1 (9.1%)
O111:NM	1 (9.1%)
O111, unspecified	1 (9.1%)
Non O157, unspecified	1 (9.1%)
Received antibiotic	
Yes	3 (20.0%)
No	9 (60.0%)
Unknown	3 (20.0%)

*Wyoming state statute requires clinical laboratories to send confirmed shiga toxin-producing *E. coli* isolates to the Wyoming Public Health Laboratory for confirmation, subtyping and pulsed-field gel electrophoresis analysis.

Table 21: Most Likely Source of Infection among Cases of Shiga-Toxin Producing *Escherichia coli* (O157:H7, non-O157, or untyped), Wyoming, 2009.

	Total, (%)
Unknown source	10 (66.7%)
Animal source	2 (13.3%)
Recreational water	1 (6.7%)
Food at home	1 (6.7%)
Raw milk	1 (6.7%)
Foreign travel	0 (0.0%)

Multiple sources	0 (0.0%)
Food at restaurant	0 (0.0%)
Secondary transmission	0 (0.0%)

Table 22: Frequency of Other Exposures among Cases of Shiga-Toxin Producing *Escherichia coli* (O157:H7, non-O157, or untyped), Wyoming, 2009.

	Total
Ate at any restaurant	9 (60.0%)
Ate at any fast food restaurant	7 (46.7%)
Consumed water from a private well	2 (13.3%)
Swam in treated water venue	2 (13.3%)
Swam in untreated water venue	3 (20.0%)
Attended daycare	2 (13.3%)
Live with daycare attendee	1 (6.7%)
Out of state travel	2 (13.3%)
International travel	0 (0.0%)

Percentages can add up to more than 100% because case patients can report more than one of these exposures.

Table 23: Frequency of Reported High-Risk Occupations among Cases of Shiga-Toxin Producing *Escherichia coli* (O157:H7, non-O157, or untyped), Wyoming, 2009.

	Total
Food-handling employee	1 (6.7%)
Healthcare worker with direct patient contact	0 (0.0%)
Daycare worker	0 (0.0%)

Public health guidelines call for the exclusion of these individuals from their high-risk occupational setting until two consecutively negative stool samples are acquired at least 72 hours after the cessation of antibiotics.

Outbreaks of Shiga-Toxin Producing *Escherichia coli* (O157:H7, non-O157, or untyped), Wyoming, 2009

Cluster of Shiga toxin-producing Escherichia coli (STEC) infections associated with common meat processor, Goshen and Platte Counties, 2009

The WDH Infectious Disease Epidemiology Program investigated two cases of STEC infections in July 2009. One case patient was from Goshen County and the other case patient was from Platte County. Both case patients were children. Molecular analyses of the case patients' bacterial isolates showed an identical PFGE match. Both case patients acquired ground beef from the same local meat processor in Goshen County. The Goshen County consumer health specialist was notified and conducted a drop-in inspection. Environmental and bovine stool samples were collected. The inspection did not reveal any critical violations in food safety. Both environmental and bovine stool samples were negative for STEC. No other cases were identified with the same molecular pattern after the investigation was initiated. Public health investigators cannot determine if the meat processor was the definitive source of the infection.

Giardiasis

Case definition

- Confirmed – a case that is laboratory confirmed via one of the following methods:
 - Demonstration of *G. lamblia* cysts in stool, or
 - Demonstration of *G. lamblia* trophozoites in stool, duodenal fluid, or small-bowel biopsy, or
 - Demonstration of *G. lamblia* antigen in stool by a specific immunodiagnostic test (e.g., enzyme-linked immunosorbent assay)
- Probable – a clinically compatible case that is epidemiologically linked to a confirmed case

Summary

In 2009, 76 cases of giardiasis were reported to the WDH Infectious Disease Epidemiology Program (16.75 cases per 100,000 per year). Of the cases reported, 65 (85.5%) were laboratory-confirmed and 11 (14.5%) were probable cases (epidemiologically-linked to a confirmed case). The incidence of giardiasis in Wyoming in 2009 was statistically greater than the estimated US incidence (6.31 cases per 100,000 per year) based on CDC National Notifiable Disease Surveillance System (SIR: 2.67, 95%CI: 2.07-3.27). The median age of cases of giardiasis was 27.5 years (range: 1-89 years). Persons aged 0-4 years had the highest age-specific incidence rate (48.22 cases per 100,000 per year). Cases were more likely to be male (55.3%) than female (44.7%). A suspected source of infection was not found for nearly half (42.0%) of all cases. Recreational water exposure (26.3%) and person-to-person transmission (15.8%) were common sources of infection.

Hot Springs County reported the highest age-adjusted incidence rate (114.70 cases per 100,000 per year); however, the rate was not statistically significant due to the low number of cases reported in this county. Campbell County and Teton County had age-adjusted incidence rates that were statistically higher than the statewide rate. Big Horn, Carbon, Crook, Fremont, Johnson, Niobrara, Platte, Washakie, and Weston Counties did not report any cases of giardiasis in 2009. All other counties had age-adjusted incidence rates that were statistically equivalent to the statewide incidence rate.

Table 24: Occurrence of Giardiasis by Case Status, Wyoming, 2009

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	8	5	3	2	5	2	8	3	8	7	3	11	65
Probable	0	0	0	2	1	3	1	0	0	2	0	2	11
Total	8	5	3	4	6	5	9	3	8	9	3	13	76

Figure 8: Incidence of Giardiasis by Month Reported, Wyoming, 2009

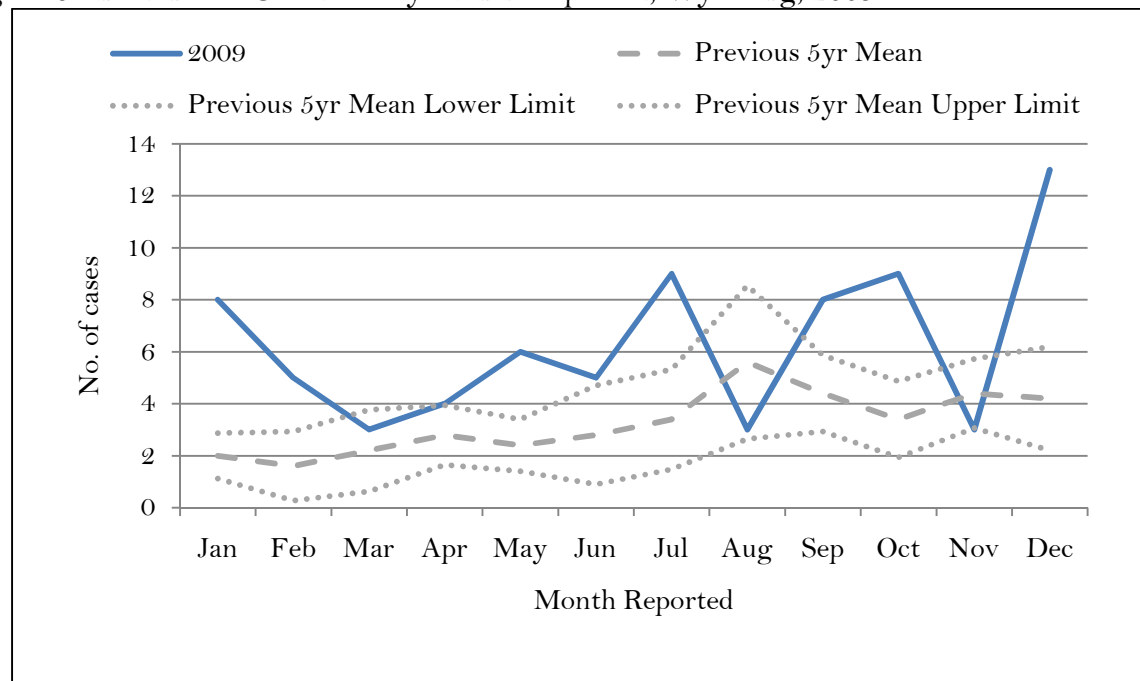


Table 25: Demographics of Case Patients with Giardiasis (N=76), Wyoming, 2009

		Total n(%)
Age		
0-4 years		17 (22.4%)
5-14 years		11 (14.5%)
15-24 years		6 (7.9%)
25-39 years		21 (27.6%)
40-64 years		16 (21.1%)
≥65 years		5 (6.6%)
Unknown		0 (0.0%)
Median age		27.5 yrs
Age range:		1-89 yrs
Gender		
Female		34 (44.7%)
Male		42 (55.3%)
Hospitalized		
Yes		3 (4.0%)
No		71 (93.4%)
Unknown		2 (2.6%)
Median no. of days hospitalized		2 days
Range of no. of days hospitalized		1-2 days
Outbreak status		
Outbreak/cluster related		0 (0.0%)

Figure 9: Age Distribution of Cases of Giardiasis (N=76), Wyoming, 2009

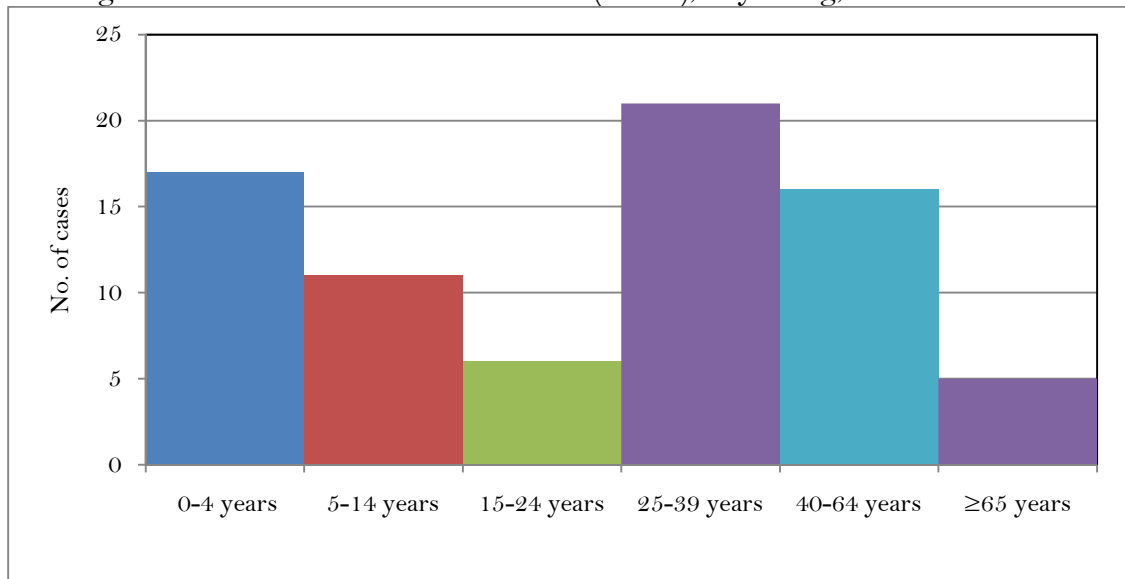


Table 26: Crude and Age-adjusted Incidence Rates of Giardiasis by County, Wyoming, 2009

	Total No. of Cases	Crude incidence rate (per 100,000 per year)	Age-adjusted incidence rate (per 100,000 per year)	SIR* (95%CI)
Albany	3	9.16	8.21	0.73 (-0.10-1.56)
Big Horn	0	0.00	0.00	—
Campbell	16	38.58	40.32	3.59 (1.83-5.34)§
Carbon	0	0.00	0.00	—
Converse	5	37.69	39.90	3.55 (0.44-6.66)
Crook	0	0.00	0.00	—
Fremont	0	0.00	0.00	—
Goshen	2	16.57	25.79	2.29 (-0.89-5.47)
Hot Springs	3	64.91	114.70	10.20 (-1.34-21.75)
Johnson	0	0.00	0.00	—
Laramie	7	8.00	7.88	0.70 (0.18-1.22)
Lincoln	1	6.01	7.82	0.70 (-0.67-2.06)
Natrona	10	13.67	14.72	1.31 (0.50-2.12)
Niobrara	0	0.00	0.00	—
Park	3	10.88	13.99	1.24 (-0.16-2.65)
Platte	0	0.00	0.00	—
Sheridan	2	6.98	4.93	0.44 (-0.17-1.05)
Sublette	2	23.65	27.32	2.43 (-0.94-5.80)
Sweetwater	7	17.52	17.94	1.60 (0.41-2.78)
Teton	9	40.87	45.12	4.01 (1.39-6.64)§
Uinta	2	9.70	10.98	0.98 (-0.38-2.33)
Washakie	0	0.00	0.00	—
Weston	0	0.00	0.00	—
Total	76	16.75	16.83	2.67 (2.07-3.27)§

*Wyoming state population used as “standard” population when calculating age-adjusted estimates for each county.

† SIR calculated using estimated national incidence rate of 6.31 cases per 100,000 per year.

§ Estimate is statistically different than the expected incidence rate. Estimates of greater than 1.00 indicate incidence is greater than what is expected and estimates less than 1.00 indicate incidence is less than what is expected and that these differences cannot be explained by differences in the age distribution of the population.

Table 27: Clinical Characteristics among Cases of Giardiasis Wyoming, 2009

	Total, (%)
Had gastrointestinal symptoms	
Yes	67 (88.2%)
No	1 (1.3%)
Unknown	8 (10.5%)
Received antiparasitic	
Yes	44 (57.9%)
No	13 (17.1%)
Unknown	19 (25.0%)

Table 28: Most Likely Source of Infection among Cases of Giardiasis Wyoming, 2009.

	Total, (%)
Unknown source	32 (42.1%)
Recreational water	20 (26.3%)
Secondary transmission	12 (15.8%)
Foreign travel	7 (9.2%)
Animal source	4 (5.3%)
Water, other	1 (1.3%)
Daycare	0 (0.0%)
Drinking water	0 (0.0%)
Food-restaurant	0 (0.0%)

Table 29: Frequency of Other Exposures among Cases of Giardiasis, Wyoming, 2009.

	Total
Ate at any restaurant	43 (56.5%)
Ate at any fast food restaurant	28 (37.8%)
Consumed water from a private well	17 (23.0%)
Swam in treated water venue	15 (20.3%)
Swam in untreated water venue	25 (33.8%)
Attended daycare	8 (10.5%)
Live with daycare attendee	10 (13.2%)
Out of state travel	26 (35.1%)
International travel	9 (12.2%)

Percentages can add up to more than 100% because case patients can report more than one of these exposures.

Table 30: Frequency of Reported High-Risk Occupations among Cases of Giardiasis, Wyoming, 2009.

	Total
Food-handling employee	4 (5.3%)
Healthcare worker with direct patient contact	3 (4.0%)
Daycare worker	0 (0.0%)

Public health guidelines call for the exclusion of these individuals from their high-risk occupational setting until 48 hours after the cessation of diarrhea.

Outbreaks of Giardiasis, 2009

Investigation of Illness Associated with RV Park, Sheridan County, 2008-2009

In January 2009, the WDH Infectious Disease Epidemiology Program continued its cooperative investigation with the U.S. Environmental Protection Agency (EPA) and the Wyoming Department of Environmental Quality (DEQ) regarding reports of illness among past/current residents of a rural RV park in Sheridan County. The WDH Infectious Disease Epidemiology Program completed 27 interviews of RV park patrons; 22 (81.5%) reported recurring gastrointestinal illness. One person, an out-of-state resident, tested positive for giardiasis at an out-of-state laboratory. The WDH Infectious Disease Epidemiology Program was not able to determine if the RV park's well water system was the source of the illness or if there were other possible sources. EPA investigated problems with the RV park's well system, which was considered to be a public water system, and DEQ investigated problems with the RV park's wastewater system. The presence of these problems suggested that water system was a potential source of illness. Attempts at testing the stool of other ill patrons were unsuccessful.

Hepatitis A

Case definition

- Confirmed – An acute illness with a) discrete onset of symptoms and b) jaundice or elevated serum aminotransferase levels that is laboratory-confirmed via detection of immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV IgM).
- Probable - a case that meets the clinical case definition (discrete onset of symptoms and jaundice or elevated serum aminotransferase levels) and occurs in a person who has an epidemiologic link to a person who has laboratory-confirmed hepatitis A infection (i.e., household or sexual contact with an infected person during the 15-50 days before the onset of symptoms)

Summary

In 2009, 3 cases of acute Hepatitis A were reported to the WDH Infectious Disease Epidemiology Program (0.66 cases per 100,000 per year). All cases were laboratory-confirmed. The incidence of acute Hepatitis A in Wyoming was statistically equivalent to the estimated US incidence (1.20 cases per 100,000 per year) based on CDC National Notifiable Disease Surveillance System (SIR: 0.55, 95%CI: -0.07-1.18). The median age of cases of acute Hepatitis A was 25 years (range: 13-59 years). Persons aged 5-14 years had the highest age-specific incidence rate (1.26 cases per 100,000 per year). All cases were female. Albany, Campbell and Teton Counties reported a single case of Hepatitis A in 2009, and the age-adjusted incidence rates in each county was statistically equivalent to the state's expected rate.

Table 31: Incidence of Acute Hepatitis A Infection by Month, Wyoming, 2009.

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	0	1	0	0	0	0	1	1	0	0	0	0	3
Probable	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	1	1	0	0	0	0	3

Legionellosis

Case definition

- Confirmed – a case that is laboratory confirmed via one of the following methods:
 - By culture: isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile fluid.
 - By detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents.
 - By seroconversion: fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents.
- Suspect – a case where *Legionella* has been detected by the following methods
 - By seroconversion: fourfold or greater rise in antibody titer to specific species or serogroups of *Legionella* other than *L. pneumophila* serogroup 1 (e.g., *L. micdadei*, *L. pneumophila* serogroup 6).
 - By seroconversion: fourfold or greater rise in antibody titer to multiple species of *Legionella* using pooled antigen and validated reagents.
 - By the detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody (DFA) staining, immunohistochemistry (IHC), or other similar method, using validated reagents.
 - By detection of *Legionella* species by a validated nucleic acid assay

Summary

In 2009, four laboratory-confirmed cases of legionellosis were reported to the WDH Infectious Disease Epidemiology Program (0.88 cases per 100,000 per year). The incidence of legionellosis in Wyoming was equivalent to the estimated US incidence (0.88 cases per 100,000 per year) based on CDC National Notifiable Disease Surveillance System (SIR: 1.22, 95%CI: 0.02-2.42).

Table 32: Incidence of Legionellosis by Month, Wyoming, 2009.

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	0	0	0	1	0	0	0	0	3	0	0	0	4
Probable	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	3	0	0	0	4

Leptospirosis

Case definition

- Confirmed – a clinically compatible case that is laboratory confirmed by one of the following methods:
 - Isolation of *Leptospira* from a clinical specimen, or
 - Fourfold or greater increase in *Leptospira* agglutination titer between acute- and convalescent-phase serum specimens obtained greater than or equal to 2 weeks apart and studied at the same laboratory, or
 - Demonstration of *Leptospira* in a clinical specimen by immunofluorescence
- Probable - a clinically compatible case with supportive serologic findings (i.e., a *Leptospira* agglutination titer of greater than or equal to 200 in one or more serum specimens)

**This condition is no longer nationally notifiable, but it is reportable in the State of Wyoming.*

Summary

In 2009, no cases of leptospirosis were reported to the WDH Infectious Disease Epidemiology Program (0.00 cases per 100,000 per year). The incidence of leptospirosis in Wyoming was statistically equivalent to the estimated US incidence (0.06 cases per 100,000 per year). (SIR: incalculable).

Outbreaks of Leptospirosis

The WDH Infectious Disease Epidemiology Program did not investigate any outbreaks of leptospirosis in 2009.

Listeriosis

Case definition

- Confirmed: A clinically compatible case that is laboratory-confirmed by one of the following methods:
 - Isolation of *L. monocytogenes* from a normally sterile site (e.g., blood or cerebrospinal fluid [CSF] or, less commonly, joint, pleural, or pericardial fluid)
 - In the setting of miscarriage or stillbirth, isolation of *L. monocytogenes* from placental or fetal tissue

Summary

In 2009, three cases of listeriosis were reported to the WDH Infectious Disease Epidemiology Program (0.66 cases per 100,000 per year); all were laboratory-confirmed via culture. The incidence of listeriosis in Wyoming was statistically equivalent to the estimated US incidence (0.26 cases per 100,000 per year) based on CDC Nationally Notifiable Disease Surveillance System (SIR: 2.50, 95%CI: -0.33-5.32). The median age of cases of listeriosis was 41 years (range: 36-82 years). Persons aged 65 years or older had the highest age-specific incidence rate (2.12 cases per 100,000 per year). All cases were female. A definitive source of infection could not be identified for two cases (66.7%). One case was believed to have acquired the infection from high risk food products – artisanal cheese or cured fish that was purchased out-of-state. None of the cases reported working in a sensitive occupation like food-handling, healthcare or childcare. Cases were reported in Albany and Sweetwater Counties. Albany County reported the highest age-adjusted incidence rate (6.67 cases per 100,000 per year), which was ten times greater than the expected statewide incidence rate (0.66 cases per 100,000 per year). However, that difference was not statistically significant due to the small number of cases reported.

Table 33: Incidence of Listeriosis by Month, Wyoming, 2009.

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	0	0	0	0	0	0	0	0	1	1	0	1	3
Probable	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	1	0	1	3

Figure 10: Incidence of Listeriosis by Month Reported (N=3), Wyoming, 2009

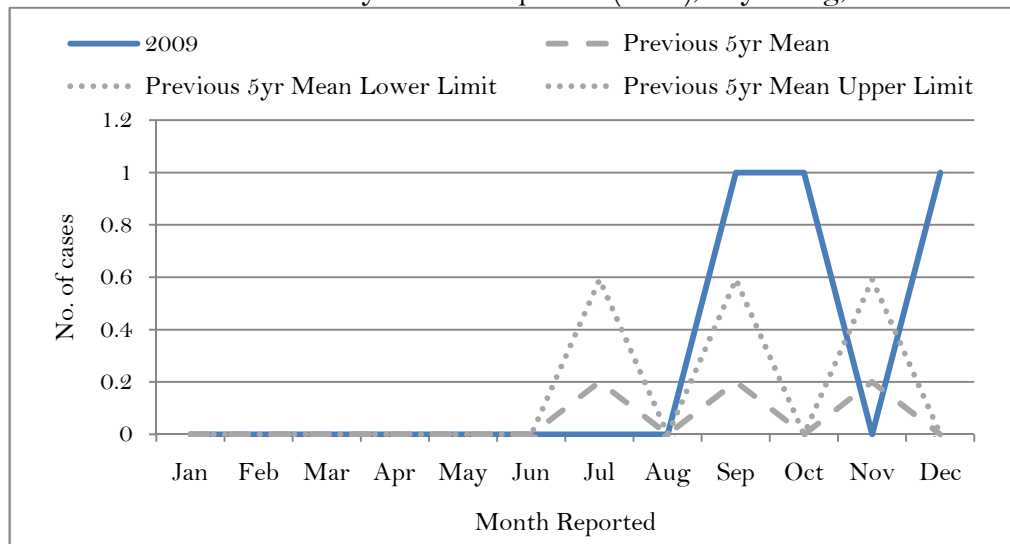


Table 34: Demographics of Case Patients with Listeriosis (N=3), Wyoming, 2009

	Total n(%)
Age	
0-4 years	0 (0.0%)
5-14 years	0 (0.0%)
15-24 years	0 (0.0%)
25-39 years	1 (33.3%)
40-64 years	1 (33.3%)
≥65 years	1 (33.3%)
Unknown	0 (0.0%)
Median age	41 years
Age range:	36-82 years
Gender	
Female	3 (100.0%)
Male	0 (0.00%)
Hospitalized	
Yes	2 (67.7%)
No	1 (33.3%)
Unknown	0 (0.0%)
Median no. of days hospitalized	6 days
Range of no. of days hospitalized	6 days
Outbreak status	
Outbreak/ cluster related	0 (0.0%)

Figure 11: Age Distribution of Cases of Listeriosis (N=3), Wyoming, 2009

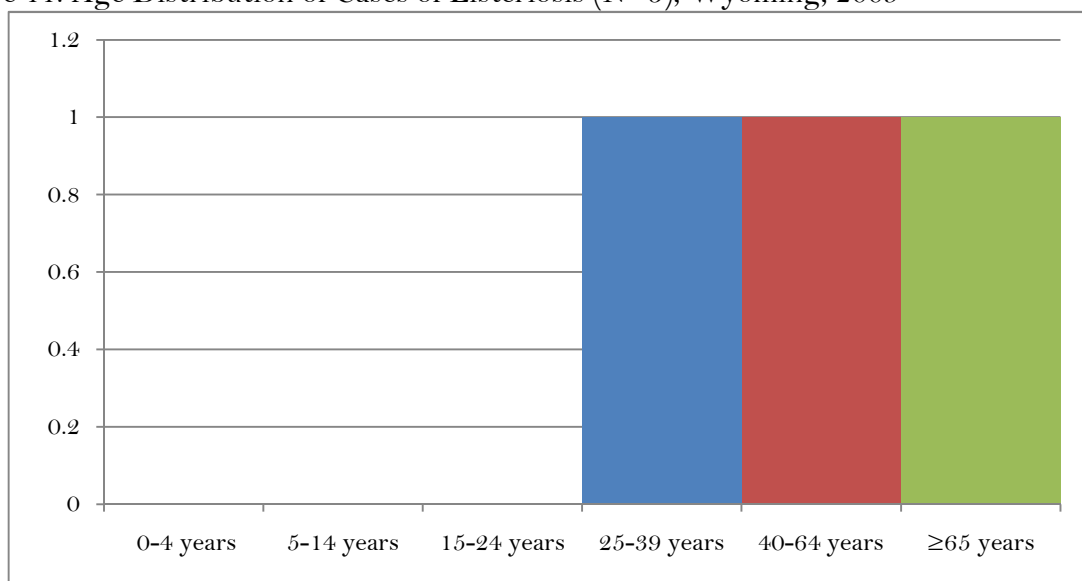


Table 35: Crude and Age-adjusted Incidence of Listeriosis by County, Wyoming, 2009

	Total No. of Cases	Crude incidence rate (per 100,000 per year)	Age-adjusted incidence rate (per 100,000 per year)	SIR* (95%CI)
Albany	2	6.11	6.67	10.11 (-3.90-24.11)
Big Horn	0	0.00	0.00	—
Campbell	0	0.00	0.00	—
Carbon	0	0.00	0.00	—
Converse	0	0.00	0.00	—
Crook	0	0.00	0.00	—
Fremont	0	0.00	0.00	—
Goshen	0	0.00	0.00	—
Hot Springs	0	0.00	0.00	—
Johnson	0	0.00	0.00	—
Laramie	0	0.00	0.00	—
Lincoln	0	0.00	0.00	—
Natrona	0	0.00	0.00	—
Niobrara	0	0.00	0.00	—
Park	0	0.00	0.00	—
Platte	0	0.00	0.00	—
Sheridan	0	0.00	0.00	—
Sublette	0	0.00	0.00	—
Sweetwater	1	2.50	3.27	4.96 (-4.76-14.68)
Teton	0	0.00	0.00	—
Uinta	0	0.00	0.00	—
Washakie	0	0.00	0.00	—
Weston	0	0.00	0.00	—
Total	3	0.66	0.65	2.50 (-0.33-5.32)

*Wyoming state population used as “standard” population when calculating age-adjusted estimates for each county.

† SIR calculated using estimated national incidence rate of 0.26 cases per 100,000 per year.

§ Estimate is statistically different than the expected incidence rate. Estimates of greater than 1.00 indicate incidence is greater than what is expected and estimates less than 1.00 indicate incidence is less than what is expected and that these differences cannot be explained by differences in the age distribution of the population.

Table 36: Clinical Characteristics among Cases of Listeriosis, Wyoming, 2009

	Total, (%)
Had gastrointestinal symptoms	
Yes	1 (33.3%)
No	0 (0.0%)
Unknown	2 (66.7%)
Specimen source	
Blood	2 (67.7%)
Cerebrospinal fluid (CSF)	1 (33.3%)
Bacterial isolate was confirmed at WPHL*	
Yes	1 (33.3%)
No	2 (66.7%)
Species of Listeria	
<i>L. monocytogenes</i>	3 (100.0%)
Received antibiotic	
Yes	2 (66.7%)
No	0 (0.0%)
Unknown	1 (33.3%)

* Wyoming state statute requires clinical laboratories to send confirmed *Listeria* isolates to the Wyoming Public Health Laboratory for confirmation and pulsed-field gel electrophoresis analysis.

Salmonellosis

Case definition

- Confirmed – a case that is laboratory confirmed by isolation of *Salmonella* bacteria from any clinical specimen
- Probable – a clinically compatible case that is epidemiologically-linked to a laboratory-confirmed case

Summary

In 2009, 97 cases of salmonellosis were reported to the WDH Infectious Disease Epidemiology Program (21.38 cases per 100,000 per year). Of the cases reported, 81 (83.5%) were laboratory-confirmed and 16 (16.5%) were probable cases (epidemiologically-linked to a confirmed case). The incidence of salmonellosis in Wyoming was statistically greater than the estimated US incidence (14.0 cases per 100,000 per year) based on CDC FoodNet sites (SIR: 1.52, 95%CI: 1.22-1.82). The median age of cases of salmonellosis was 23 years (range: 0-88 years). Children aged 0-4 years had the highest age-specific incidence rate (65.23 cases per 100,000 per year), which was approximately three times higher than the incidence rate for the general population. Cases were more likely to be female (58.8%) than male (41.2%). While a definitive source of the infection could not be determined in nearly 54.6% of all cases, contact with animals (especially reptiles and rodents) is a common source of *Salmonella* infection in Wyoming. Direct or indirect contact with high risk animals was the leading source of *Salmonella* infection in children 5 years of age or less (50.0%).

Converse County reported the highest age-adjusted incidence rate (62.50 cases per 100,000 per year), which was nearly three times the expected statewide incidence rate; however, due to the small number of cases in Converse County, that rate difference was not statistically significant. Sweetwater County (43.74 cases per 100,000 per year) had an age-adjusted incidence rate that was statistically greater than the statewide incidence rate. Big Horn (6.79 cases per 100,000 per year), Fremont (8.19 cases per 100,000 per year), Natrona (11.28 cases per 100,000 per year), Park (5.99 cases per 100,000 per year), and Teton (6.55 cases per 100,000 per year) Counties had an age-adjusted incidence rate that were statistically less than the statewide incidence rate. Carbon, Goshen, Niobrara, Sublette, and Uinta Counties did not report any cases of salmonellosis in 2009. All other counties had age-adjusted incidence rates that were statistically equivalent to the statewide incidence rate.

Table 37: Occurrence of Salmonellosis by Month Reported and by Status, Wyoming, 2009

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	2	3	8	4	4	12	14	12	4	8	4	6	81
Probable	0	0	0	3	2	1	3	0	0	3	4	0	16
Total	2	3	8	7	6	13	17	12	4	11	8	6	97

Figure 12: Incidence of Salmonellosis by Month Reported, Wyoming, 2003-2009

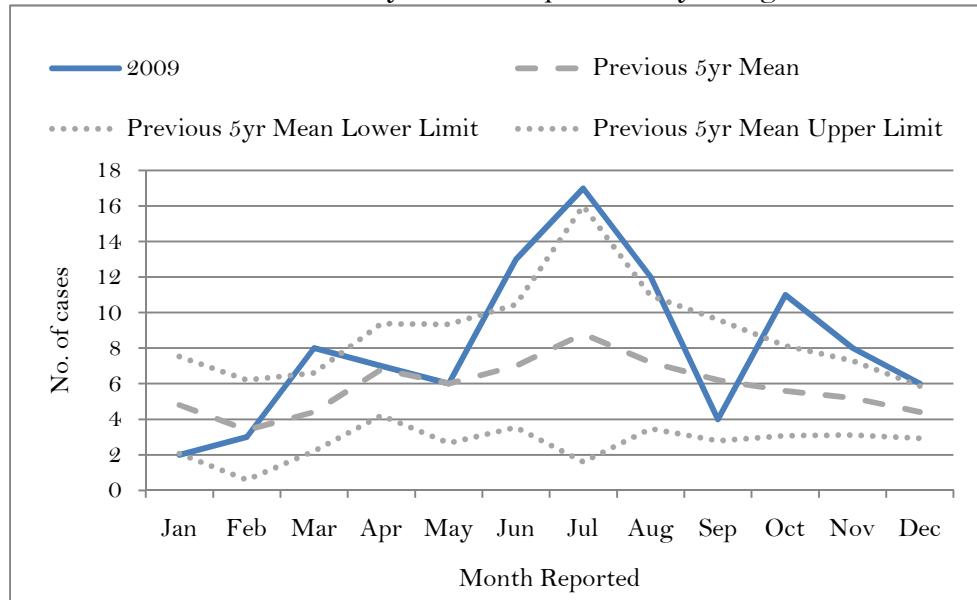


Table 38: Demographics of Case Patients with Salmonellosis (N=97), Wyoming, 2009

	Total n(%)
Age	
0-4 years	23 (23.7%)
5-14 years	13 (13.4%)
15-24 years	13 (13.4%)
25-39 years	12 (12.4%)
40-64 years	28 (20.9%)
≥65 years	7 (7.2%)
Unknown	1 (1.0%)
Median age	23 years
Age range:	0-88 years
Gender	
Female	57 (58.8%)
Male	40 (41.2%)
Hospitalized	
Yes	31 (32.0%)
No	66 (68.0%)
Unknown	0 (0.0%)
Median no. of days hospitalized	3.0 days
Range of no. of days hospitalized	1-16 days
Outbreak status	
Outbreak/ cluster related	23 (23.7%)

Figure 13: Age Distribution of Cases of Salmonellosis (N=97), Wyoming, 2009

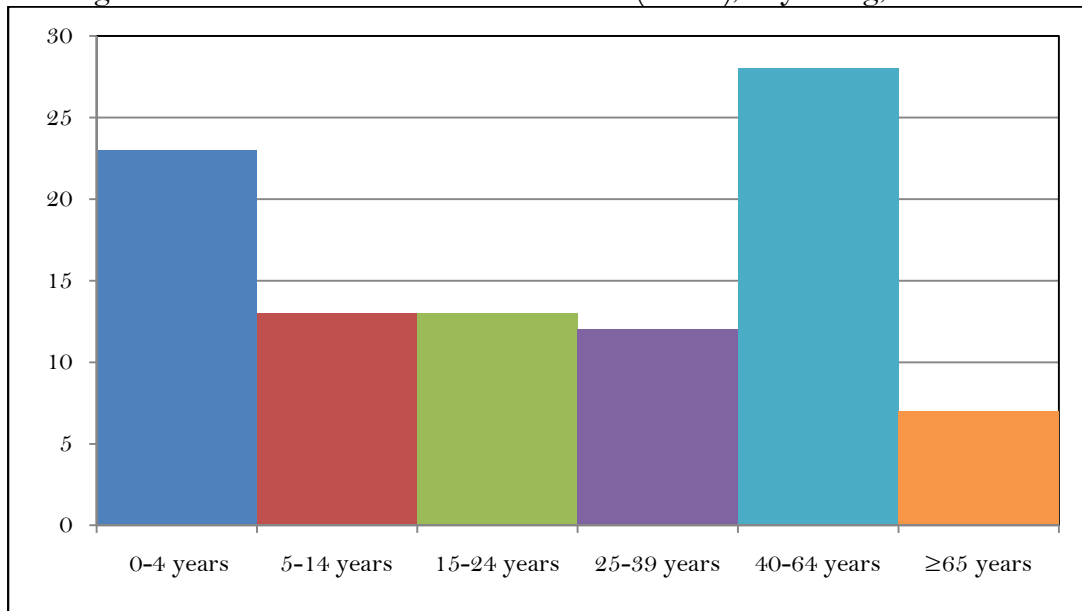


Table 39: Crude and Age-adjusted Incidence of Salmonellosis by County, Wyoming, 2009

	Total No. of Cases	Crude incidence rate (per 100,000 per year)	Age-adjusted incidence rate (per 100,000 per year)	SIR* (95%CI)
Albany	5	15.26	15.48	0.72 (0.09-1.36)
Big Horn	1	8.83	6.79	0.32 (-0.30-0.94)§
Campbell	8	19.29	21.08	0.99 (0.30-1.67)
Carbon	0	0.00	0.00	—
Converse	8	60.30	62.50	2.92 (0.90-4.95)
Crook	2	30.97	21.93	1.03 (-0.40-2.45)
Fremont	3	7.87	8.19	0.38 (-0.05-0.82)§
Goshen	0	0.00	0.00	—
Hot Springs	1	21.64	35.40	1.66 (-1.59-4.90)
Johnson	2	23.63	31.87	1.49 (-0.58-3.56)
Laramie	24	27.42	25.96	1.21 (0.73-1.70)
Lincoln	3	18.04	15.02	0.70 (-0.09-1.50)
Natrona	7	9.57	11.28	0.53 (0.14-0.92)§
Niobrara	0	0.00	0.00	—
Park	2	7.25	5.99	0.28 (-0.11-0.67)§
Platte	2	24.11	39.31	1.84 (-0.71-4.39)
Sheridan	7	24.42	23.94	1.12 (0.29-1.95)
Sublette	0	0.00	0.00	—
Sweetwater	16	40.06	43.74	2.05 (1.04-3.05)§
Teton	2	9.08	6.55	0.31 (-0.12-0.73)§
Uinta	0	0.00	0.00	—
Washakie	3	38.36	23.16	1.08 (-0.14-2.31)
Weston	1	14.24	10.10	0.47 (-0.45-1.40)
Total	97	21.38	21.27	1.52 (1.22-1.82)†§

*Wyoming state population used as “standard” population when calculating age-adjusted estimates for each county.

† SIR calculated using estimated national incidence rate of 14.00 cases per 100,000 per year.

§ Estimate is statistically different than the expected incidence rate. Estimates of greater than 1.00 indicate incidence is greater than what is expected and estimates less than 1.00 indicate incidence is less than what is expected and that these differences cannot be explained by differences in the age distribution of the population.

Table 40: Clinical Characteristics among Cases of Salmonellosis, Wyoming, 2009

	Total, (%)
Had gastrointestinal symptoms	
Yes	86 (88.7%)
No	1 (1.0%)
Unknown	10 (10.3%)
Specimen source	
Stool	70 (72.2%)
Blood	6 (6.2%)
Urine	5 (5.2%)
Other	0 (0.0%)
Unknown	1 (1.2%)
Bacterial isolate was confirmed at WPHL*	
Yes	77 (79.4%)
No	20 (20.6%)
Received antibiotic	
Yes	45 (46.4%)
No	32 (33.0%)
Unknown	20 (20.6%)

* Wyoming state statute requires clinical laboratories to send confirmed *Salmonella* isolates to the Wyoming Public Health Laboratory for confirmation, subtyping and pulsed-field gel electrophoresis analysis.

Table 41: Reported *Salmonella* Serotypes (N=75) by Year, Wyoming, 2009.

	Total, (%)
Typhimurium	17 (22.7%)
Enteritidis	16 (21.3%)
Newport	8 (10.7%)
Typhimurium var O5 (Copenhagen)	7 (9.3%)
Montevideo	6 (8.0%)
I4,[5],12:i-	3 (4.0%)
Pomona	3 (4.0%)
Dublin	2 (2.7%)
Heidelberg	2 (2.7%)
Javiana	2 (2.7%)
Adelaide	1 (1.3%)
Bareilly	1 (1.3%)
Braenderup	1 (1.3%)
Fluntern	1 (1.3%)
Fresno	1 (1.3%)
Oranienburg	1 (1.3%)
Paratyphi B tartrate positive	1 (1.3%)
Seftenberg	1 (1.3%)
Urbana	1 (1.3%)

** Wyoming state statute requires clinical laboratories to send confirmed Salmonella isolates to the Wyoming Public Health Laboratory for confirmation, subtyping and pulsed-field gel electrophoresis analysis.*

Table 42: Most Likely Source of Infection among Cases of Salmonellosis, Wyoming, 2009.

	Total, (%)
Source not evident	53 (54.6%)
Animal source	22 (22.7%)
Foreign travel	8 (8.3%)
Food source at home	8 (8.3%)
Food source at restaurant or other food venue	3 (3.1%)
Person-to-person transmission	2 (2.1%)
Daycare transmission	0 (0.0%)
Multiple exposures	0 (0.0%)
Environmental contamination	0 (0.0%)
Occupational exposure	0 (0.0%)

Table 43: Frequency of Certain Animal Exposures Reported by Cases of Salmonellosis, Wyoming, 2009.

	Total
Contact with dog	58 (59.8%)
Contact with cat	30 (30.9%)
Contact with reptile	19 (19.6%)
Contact with rodent	11 (11.3%)
Contact with bird	7 (7.2%)
Contact with amphibian	5 (5.2%)
Contact with cattle	3 (3.1%)
Contact with sheep	3 (3.1%)
Contact with goat	2 (2.1%)
Contact with horse	2 (2.1%)
Contact with pig	0 (0.0%)

Percentages can add up to more than 100% because case patients can report exposure to more than one of these types of animals.

Table 44: Frequency of Other Exposures among Cases of Salmonellosis, Wyoming, 2009.

	Total
Ate at any restaurant	64 (66.0%)
Ate at any fast food restaurant	40 (41.2%)
Consumed water from a private well	10 (10.3%)
Swam in treated water venue	11 (11.3%)
Swam in untreated water venue	10 (10.3%)
Attended daycare	5 (5.2%)
Live with daycare attendee	4 (4.1%)
Out of state travel	20 (20.6%)
International travel	9 (9.3%)

Percentages can add up to more than 100% because case patients can report more than one of these exposures.

Table 45: Frequency of Reported High-Risk Occupations among Cases of Salmonellosis, Wyoming, 2009.

	Total
Food-handling employee	3 (3.1%)
Healthcare worker with direct patient contact	2 (2.1%)
Daycare worker	0 (0.0%)

Public health guidelines call for the exclusion of these individuals from their high-risk occupational setting until the patient has provided two consecutively negative stool samples that were collected at least 24 hours apart and at least 72 hours after the cessation of antibiotic therapy.

Outbreaks of Salmonellosis, 2009

Cluster of Salmonella Pomona Infections Associated in Young Children, Sweetwater County

In late February and early March 2009, the WDH Infectious Disease Epidemiology Program identified two cases of *Salmonella* serotype Pomona in young children in Sweetwater County. Attempts to follow-up with the parent or guardian of the first case were unsuccessful. Follow-up with the parent of the second case patient revealed that the child had indirect exposure to a multitude of exotic pets including, red slider turtles, bearded dragons, crocodiles, and cockatiels. PFGE analyses of the two patients' *Salmonella* isolates revealed an identical match. Additional cases with a PFGE match were identified in Colorado and Iowa. Information exchanged with Colorado public health officials revealed that the Colorado case patient, also a young child, had a history of exposure to turtles. Both CDC and FDA were contacted. Traceback investigations were initiated in both Colorado and Wyoming to examine the possibility of a common source. The Iowa case patient did not report a history of exposure to reptiles or other exotic pets. Traceback investigations did not reveal a common source for animals among the Wyoming and Colorado case patients.

Outbreak of Salmonella Enteritidis, Sweetwater County

In April 2009, the WDH Infectious Disease Epidemiology Program identified an increase in the number of cases of *Salmonella* Enteritidis. Since January 1, 2009, 14 cases of salmonellosis have been reported in Sweetwater County. County-level incidence rates for salmonellosis are statistically higher than the previous 9-year average. Among the 11 cases, 5 were epidemiologically linked to one household (Family #1), the other 5 were epidemiologically-linked to another household (Family #2), and the last case (Case #11) who reported no illness in household members or close contacts. Routine follow-up has identified two possible epidemiologic links between the three households. Family #1 and Case #11 both reported eating at a fried chicken fast food venue during their exposure periods. Family #2 and Case #11 both had pets in the household that had been recently acquired at the same local pet store. The WDH Infectious Disease Epidemiology Program and Sweetwater County Environmental Health staff worked cooperatively to investigate the possible common exposures among the eleven case patients. A kitchen inspection at the food venue did not identify any critical violations in the Wyoming Food Safety Rule. Environmental health staff also visited the local pet store for follow-up. The investigation did not identify enough evidence to implicate either venue. The WDH Infectious Disease Epidemiology Program did not receive additional reports of *Salmonella* Enteritidis with the common molecular pattern in Sweetwater County or with a travel history to Sweetwater County.

Multistate Outbreak of Salmonella Montevideo Associated with North Dakota Caterer

In June 2009, the WDH Infectious Disease Epidemiology Program identified a case of *Salmonella* Montevideo in an adult Sweetwater County resident. The Wyoming case patient had attended a wedding in North Dakota that was associated to an outbreak linked to a North Dakota caterer. At least 180 people were sickened by the one, unlicensed caterer who prepared food for three separate events (2 weddings, 1 reunion). The source of the infection was linked to the caterer's chickens that she raised at home and to her inadequate hand washing hygiene.

Multistate Outbreak of Salmonella Newport Associated with Ground Beef

In June-August 2009, the WDH Infectious Disease Epidemiology Program investigated four cases of *Salmonella* Newport in Wyoming residents that were found to be associated with a multistate outbreak of *Salmonella* Newport linked to ground beef. Two cases were from Laramie County, one case was from Natrona County, and one case was from Fremont County. Two cases were children and two were adults. All cases confirmed eating the implicated ground beef. In late July 2009, the USDA issued multiple class I recalls in relation to this outbreak. The implicated ground beef was sold at Safeway stores and Sam's Clubs around Wyoming.

http://www.fsis.usda.gov/News_&_Events/Recall_039_2009_Release/index.asp

http://www.fsis.usda.gov/News_&_Events/Recall_041_2009_Release/index.asp

http://www.fsis.usda.gov/News_&_Events/Recall_065_2009_Release/index.asp

Multistate Outbreak of Salmonella Montevideo Associated with Black and Red Pepper-Containing Products

In July 2009, the WDH Infectious Disease Epidemiology Program investigated two cases of *Salmonella* Montevideo with a unique molecular pattern associated with a multistate outbreak linked to products containing black and red pepper. At least 272 cases in 44 states and the District of Columbia were identified by public health officials. The two Wyoming cases were from Converse County. Both Wyoming cases developed illness in early July and both cases were hospitalized. Wyoming public health officials are unsure whether the two Wyoming cases ate implicated foods; however, the cases report shopping at grocery store chains where many of the recalled products were sold.

A summary of this multistate outbreak, including recall notices, can be found on the CDC's website at: <http://www.cdc.gov/salmonella/montevideo/index.html>.

Multistate Outbreak of Salmonella Typhimurium

In August through September 2009, the WDH Infectious Disease Epidemiology Program participated in an investigation of a multistate outbreak of *Salmonella* Typhimurium. Three Wyoming residents were shown to have both a molecular link and an epidemiologic link to this outbreak. One case is an adult from Washakie County, one case is a child from Laramie County, and one case is an adult from Park County. At least, 158 cases in 27 states were identified. Ages of case patients ranged from 1-87 years with a median of 28 years, and 51.0% of cases were female. Investigators believed there may have been a link between illness and consumption shredded lettuce. The national investigation was not able to confirm the definitive source of the outbreak.

Shigellosis

Case definition

- Confirmed – a case that is laboratory confirmed by isolation of *Shigella* bacteria from any clinical specimen
- Probable – a clinically compatible case that is epidemiologically-linked to a laboratory-confirmed case

Summary

In 2009, four cases of shigellosis were reported to the WDH Infectious Disease Epidemiology Program (0.88 cases per 100,000 per year). Of the cases reported, two (50.0%) were laboratory-confirmed and two (50.0%) were probable cases (epidemiologically-linked to a confirmed case). The incidence of shigellosis in Wyoming was statistically less than the estimated US incidence (6.59 cases per 100,000 per year) based on CDC FoodNet sites (SIR: 0.14, 95%CI: 0.00-0.27). The median age of cases of shigellosis was 3.5 years (range: 1-35 years). Persons aged 0-4 years had the highest age-specific incidence rate (8.51 cases per 100,000 per year), which was approximately ten times higher than the incidence rate for the general population. Males and females were equally reported (50.0%). No evidence source of illness was found for 50.0% of case patients. Two cases (50.0%) were associated with an outbreak in Arizona where person-to-person transmission occurred.

Fremont County reported the highest age-adjusted incidence rate (5.35 cases per 100,000 per year), but this rate was not statistically greater than the expected state rate. Laramie and Teton Counties reported cases of shigellosis in 2009, and their age-adjusted incidence rates were equivalent to the statewide incidence rate.

Table 46: Occurrence of Shigellosis by Year Reported and by Status, Wyoming, 2009

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	0	0	0	0	0	0	1	0	1	0	0	0	2
Probable	0	0	0	0	0	0	0	0	0	0	2	0	2
Total	0	0	0	0	0	0	1	0	1	0	2	0	4

Figure 14: Incidence of Shigellosis by Month Reported, Wyoming, 2009

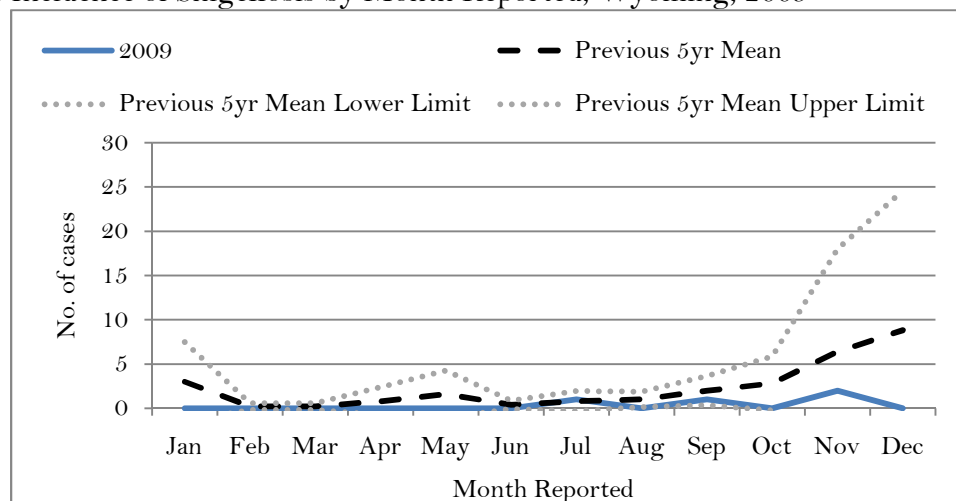


Table 47: Demographics of Case Patients with Shigellosis (N=4), Wyoming, 2009

	Total n(%)
Age	
0-4 years	3 (75.0%)
5-14 years	0 (0.0%)
15-24 years	0 (0.0%)
25-39 years	1 (25.0%)
40-64 years	0 (0.0%)
≥65 years	0 (0.0%)
Unknown	0 (0.0%)
Median age	3.5 years
Age range:	1-35 years
Gender	
Female	2 (50.0%)
Male	2 (50.0%)
Hospitalized	
Yes	1 (25.0%)
No	3 (75.0%)
Unknown	0 (0.0%)
Median no. of days hospitalized	2 days
Range of no. of days hospitalized	2 days
Outbreak status	
Outbreak/ cluster related	2 (50.0%)

Figure 15: Age Distribution of Cases of Shigellosis (N=4), Wyoming, 2009

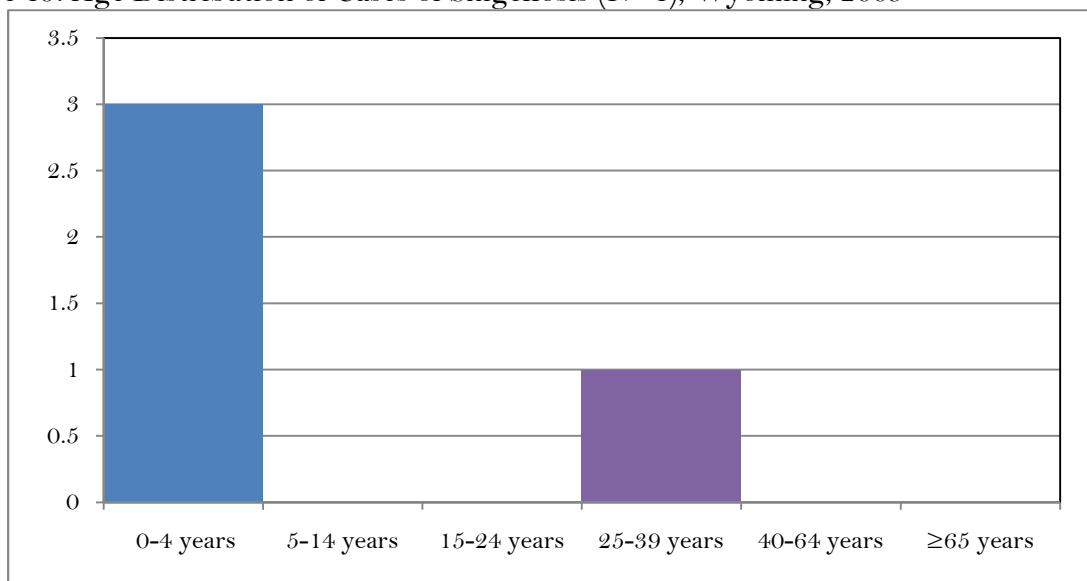


Table 48: Crude and Age-adjusted Incidence of Shigellosis by County, Wyoming, 2009

	Total No. of Cases	Crude incidence rate (per 100,000 per year)	Age-adjusted incidence rate (per 100,000 per year)	SIR* (95%CI)
Albany	0	0.00	0.00	—
Big Horn	0	0.00	0.00	—
Campbell	0	0.00	0.00	—
Carbon	0	0.00	0.00	—
Converse	0	0.00	0.00	—
Crook	0	0.00	0.00	—
Fremont	2	5.25	5.35	6.07 (-2.34-14.49)
Goshen	0	0.00	0.00	—
Hot Springs	0	0.00	0.00	—
Johnson	0	0.00	0.00	—
Laramie	1	1.14	1.21	1.37 (-1.31-4.05)
Lincoln	0	0.00	0.00	—
Natrona	0	0.00	0.00	—
Niobrara	0	0.00	0.00	—
Park	0	0.00	0.00	—
Platte	0	0.00	0.00	—
Sheridan	0	0.00	0.00	—
Sublette	0	0.00	0.00	—
Sweetwater	0	0.00	0.00	—
Teton	1	4.54	4.39	4.99 (-4.79-14.77)
Uinta	0	0.00	0.00	—
Washakie	0	0.00	0.00	—
Weston	0	0.00	0.00	—
Total	4	0.88	0.90	0.14 (0.00-0.27)†§

*Wyoming state population used as “standard” population when calculating age-adjusted estimates for each county.

† SIR calculated using estimated national incidence rate of 6.59 cases per 100,000 per year.

§ Estimate is statistically different than the expected incidence rate. Estimates of greater than 1.00 indicate incidence is greater than what is expected and estimates less than 1.00 indicate incidence is less than what is expected and that these differences cannot be explained by differences in the age distribution of the population.

Table 49: Clinical Characteristics among Cases of Shigellosis, Wyoming, 2009

	Total, (%)
Had gastrointestinal symptoms	
Yes	3 (75.0%)
No	0 (0.0%)
Unknown	1 (25.0%)
Specimen source	
Stool	2 (50.0%)
Bacterial isolate was confirmed at WPHL*	
Yes	2 (50.0%)
No	2 (50.0%)
Species of <i>Shigella</i> (N=2)	
<i>S. sonnei</i>	1 (50.0%)
<i>S. flexneri</i>	1 (50.0%)

Received antibiotic	
Yes	3 (75.0%)
No	0 (0.0%)
Unknown	1 (25.0%)

** Wyoming state statute requires clinical laboratories to send confirmed Salmonella isolates to the Wyoming Public Health Laboratory for confirmation, subtyping and pulsed-field gel electrophoresis analysis.*

Table 50: Most Likely Source of Infection among Cases of Shigellosis, Wyoming, 2009.

	Total, (%)
Person-to-person transmission	2 (50.0%)
No source evident	2 (50.0%)

Table 51: Frequency of Other Exposures among Cases of Shigellosis, Wyoming, 2009.

	Total
Ate at any restaurant	1 (25.0%)
Ate at any fast food restaurant	1 (25.0%)
Consumed water from a private well	0 (0.0%)
Swam in treated water venue	0 (0.0%)
Swam in untreated water venue	1 (25.0%)
Attended daycare	0 (0.0%)
Live with daycare attendee	0 (0.0%)
Out of state travel	2 (50.0%)
International travel	0 (0.0%)

Percentages can add up to more than 100% because case patients can report more than one of these exposures.

Table 52: Frequency of Reported High-Risk Occupations among Cases of Shigellosis, Wyoming, 2009.

	Total
Food-handling employee	0 (0.0%)
Healthcare worker with direct patient contact	0 (0.0%)
Daycare worker	0 (0.0%)

Public health guidelines call for the exclusion of these individuals from their high-risk occupational setting until the patient has provided two consecutively negative stool samples that were collected at least 24 hours apart and at least 72 hours after the cessation of antibiotic therapy.

Trichinellosis

Case definition

- Confirmed – a clinically compatible case that is laboratory-confirmed using at least one of the following methods:
 - Demonstration of *Trichinella* larvae in tissue obtained by muscle biopsy, or
 - Positive serologic test for *Trichinella*

Summary

In 2009, no cases of trichinellosis were reported to the WDH Infectious Disease Epidemiology Program (0.00 cases per 100,000 per year). The incidence of trichinellosis in Wyoming was statistically equivalent to the estimated US incidence (0.00 cases per 100,000 per year) based on CDC National Notifiable Disease Surveillance System.

Outbreaks of Trichinellosis

The WDH Infectious Disease Epidemiology Program did not investigate any outbreaks of trichinellosis in 2009.

Vibrio (cholera and non-cholera species)

Case definition

- *Vibrio cholerae* (Cholera)
 - Confirmed – isolation of toxigenic (cholera toxin-producing) *Vibrio cholerae* O1 or O139 from a clinical specimen
 - Probable – a clinically compatible symptomatic case that is epidemiologically-linked to a confirmed case
- Non cholera *Vibrio* species (Vibriosis)
 - Confirmed - isolate of *Vibrio* species other than toxigenic *Vibrio cholerae* O1 or O139 from a clinical specimen
 - Probable – a clinically compatible symptomatic case that is epidemiologically-linked to a confirmed case

Summary

In 2009, no cases of cholera or non-cholera vibriosis were reported to the WDH Infectious Disease Epidemiology Program (0.00 cases per 100,000 per year). The incidence of cholera in Wyoming was statistically equivalent to the estimated US incidence (0.00 cases per 100,000 per year) (SIR: incalculable), and the incidence of non-cholera vibriosis in Wyoming was also statistically equivalent to the estimated US incidence (0.18 cases per 100,000 per year).

Outbreaks of Cholera or Non-cholera Vibriosis

The WDH Infectious Disease Epidemiology Program did not investigate any outbreaks of cholera (*Vibrio cholerae*) or non-cholera vibriosis (*Vibrio species* other than *V. cholerae*) in 2009.

Yersiniosis

Case definition:

- Confirmed – isolation of *Yersinia* species from a clinical specimen
- Probable – a clinically compatible case that is epidemiologically-linked to a confirmed case

This disease is not nationally notifiable, and therefore the case definition is used in Wyoming for surveillance purposes.

Summary

In 2009, no cases of yersiniosis were reported to the WDH Infectious Disease Epidemiology Program (0.00 cases per 100,000 per year). The incidence of yersiniosis in Wyoming was statistically equivalent to the estimated US incidence (1.00 cases per 100,000 per year) (SIR: incalculable).

Outbreaks of Yersiniosis

The WDH Infectious Disease Epidemiology Program did not investigate any outbreaks of yersiniosis in Wyoming in 2009.

Summary of Other Enteric Disease Outbreaks Not Summarized Above

Restaurant-Associated Norovirus, Platte County

In February 2009, the WDH Infectious Disease Epidemiology Program was notified by a consumer health specialist of three separate food complaints associated with a Platte County restaurant. Follow-up with the plaintiffs revealed a total of 11 patrons with illness shortly after eating at the restaurant. Median incubation period was 30 hours, and median duration of illness was 51 hours. All ill persons reported eating from the restaurant's salad bar. Symptoms consisted of nausea, vomiting, diarrhea, and stomach cramping. No hospitalizations or deaths were reported. One secondary case was reported in an ill patron's wife who had not eaten at the restaurant. Stool samples were collected from four ill patrons. Norovirus genogroup II was confirmed in all four samples. Follow-up with restaurant staff revealed two employees who reported illness consistent with norovirus gastroenteritis prior to patrons' illnesses. Specifically, one ill employee was responsible for preparing ready-to-eat foods for the salad bar and worked while potentially shedding the virus. Follow-up with this employee revealed an ill child in her household as well. This child was tested and was also positive for norovirus genogroup II. Upon further follow-up, the ill child was known to have attended a local daycare. A secondary case was identified in the daycare and this case was confirmed with norovirus. A total of 11 ill patrons, 2 ill restaurant employees, and three secondary cases were identified to be epidemiologically related to this outbreak. Six of 11 were confirmed with norovirus infection. For prevention measures, the restaurant was required to exclude all ill foodhandlers from work for at least 48 hours after the last bout of diarrhea or vomiting (whichever occurred last), to thoroughly clean all food preparation surfaces with a concentrated bleach solution, to use gloves when handling raw and ready-to-eat food products, and to implement mandatory hand-washing to minimize the opportunities for virus transmission.

Daycare Related Gastroenteritis, Johnson County

In February 2009, the WDH Infectious Disease Epidemiology Program was notified of a cluster of children with gastroenteritis that attend a local daycare in Johnson County. The daycare provider reported that four children developed symptoms of nausea, diarrhea and vomiting shortly after consuming instant oatmeal. One child also reported a fever (102°F) and hives. The daycare provider believed that the illness was caused by tainted oatmeal, and had contacted the oatmeal producer to report the illnesses. WDH Infectious Disease Epidemiology Program follow-up with parents of the ill children showed that the four children developed symptoms of gastroenteritis on the dates of February 5-7, 2009. One child was seen by a local healthcare provider and stool testing was done for bacterial pathogens, parasitic diseases, rotavirus and C. difficile. All tests were negative. Norovirus testing was not performed. Ill children did not report any other common exposure besides attendance at the daycare and consumption of the instant oatmeal. Investigators were not able to rule out the oatmeal as a possible source of illness; however, investigators were also not able to rule out a more likely source of illness such as person-to-person transmission of norovirus. No additional cases were identified and reviews of FDA voluntary recalls did not indicate a problem with the oatmeal product.

Outbreak of Acute Rash Illness Associated with Hotel Pool and Spa, Albany County

In March 2009, the WDH Infectious Disease Epidemiology Program was notified by a consumer health specialist with the City of Laramie of two family members who had developed a rash illness after using a Albany County hotel swimming pool and spa. The ill persons were Natrona County residents. A drop-in pool and spa inspection revealed numerous violations and problems with water chemistry. The spa was reported to be “foamy” and highly turbid. Pool and spa chemicals were not within normal limits. The chlorine residual was significantly below the recommended range. The hotel did not have a certified pool and spa operator on staff. The facility had recently opened and the manager had been told that the pool/spa chemistry would be maintained via computer by off-site operators. The pool and spa were closed that day until pool chemistry was corrected and until the hotel could hire a certified pool and spa operator. On March 23, 2009, subsequent reports of rash illness were received. A family from Missouri reported patronizing the hotel around the same dates as the first plaintiff; all 6 of the family members experienced rash. A Missouri physician had diagnosed them with “hot tub rash”. *Pseudomonas aeruginosa* is a common cause of rash illness associated with treated water venues. The bacteria are present in the environment surrounding the pool and spa and can cause rash illness when inadequate disinfection of both water and environmental surfaces occur. Public health officials recommended the following interventions before re-opening the pool and spa: 1) Acquire a certified pool and spa operator, 2) Shock chlorinate the pool to 20ppm for at least 8 hours and then bring the residual down to recommended levels, 3) Bring other indicators of safe pool chemistry into recommended ranges, 4) Thoroughly clean and scrub the pool and spa decks to reduce amount of environmental contamination.

Multistate Outbreak of Norovirus Gastroenteritis Associated with Wedding in Arizona

In April 2009, the WDH Infectious Disease Epidemiology Program was notified by a Wyoming resident of a group of ill individuals who had attended a wedding in Maricopa County, Arizona in April. Many Wyoming residents had attended the wedding; most were residents of Laramie County. The WDH Infectious Disease Epidemiology Program subsequently notified both the Arizona Department of Health and the Maricopa County Department of Health about the illnesses. Maricopa County Department of Health took over as the lead investigative agency for the outbreak. Cheyenne-Laramie County Health Department and the WDH Infectious Disease Epidemiology Program facilitated testing of stool samples of ill Wyoming residents at the Wyoming Public Health Laboratory. Three stool samples submitted to the Wyoming Public Health Laboratory tested positive for norovirus genogroup II and were negative for bacterial pathogens. Investigators from Maricopa County found no indication of a point source of the outbreak. Epidemiologic follow-up with all wedding guests identified some wedding guests that reported illness prior to attending wedding events and also found evidence of contamination of food buffets with the virus. Both direct and indirect person-to-person transmission were suspected of propagating the outbreak. At least fifteen Laramie County residents were affected, including one secondary case.

Outbreak of Norovirus Gastroenteritis Associated with Wedding, Albany County

In June 2009, the WDH Infectious Disease Epidemiology Program was notified of an outbreak of gastroenteritis associated with a wedding in Albany County. Approximately 30 people were known to be ill with nausea, vomiting, and diarrhea. Several wedding related events occurred over the entire weekend, including a rehearsal dinner, wedding party snacks and wedding reception, and two family brunches. The WDH Infectious Disease Epidemiology Program worked cooperatively with the City of Laramie to investigate the outbreak. A retrospective cohort study was conducted among all wedding guests. Stool samples were collected on five wedding guests. Two were tested for bacterial pathogens via culture and for *C. difficile* via assay at the local hospital laboratory. Three were tested at state public health laboratories for bacterial pathogens via culture and for noroviruses via PCR. Three samples were positive for norovirus genogroup II. Investigators interviewed a total of 210 individuals, 43 of whom met the case definition for gastroenteritis (diarrhea with three or more loose stools in 24h period or vomiting after attending at least one wedding-related activity). The investigation showed that widespread contamination of food, beverage and environmental surfaces and person-to-person contact was responsible for the outbreak. The outbreak was not caused by a point source as the wedding reception as guests suspected.

Outbreak of Echovirus Meningitis in Young Adults, Weston County

In September 2009, the WDH Infectious Disease Epidemiology Program was notified of several cases of viral meningitis among children in Weston County. A total of three children (16-17 year old males) presented to the same healthcare provider in Weston County all with similar symptoms associated with viral meningitis; including fever, severe headache, mental status changes, and nausea. Echovirus was isolated from the cerebral spinal fluid (CSF) of one case patient and typed by monoclonal antibodies at an out of state laboratory. Another patient had CSF chemical and biological parameters consistent with viral meningitis. A CSF sample was not obtained from the third child. Further investigation revealed that the three children went on a camping trip together with a fourth child approximately one to two weeks prior to symptom onset. The case patients did not recall being sick prior to the camping trip; however they shared drinks and food the entire weekend and did not wash their hands often. Echoviruses are transmitted via the fecal-oral route.

Outbreak of Norovirus Gastroenteritis Associated with a Sorority, Albany County

In September 2009, the WDH Infectious Disease Epidemiology Program was notified of an outbreak of gastrointestinal illness among sorority members and staff in Albany County. The investigation identified 22 sorority members and staff who met the case definition for viral gastroenteritis (diarrhea [3 or more loose stools in a 24h period] or vomiting from September 7-September 21, 2009). Two sorority members tested positive for norovirus genogroup II via PCR at two different laboratories. Statistical analyses identified a number of ready-to-eat foods to be associated with illness. These foods were served on lunch and dinner buffets at the sorority chapter house. Three ill food-handling staff were identified. One sorority member and one food-handler were ill much earlier than the rest of the group, suggesting that one or both of them may have contaminated the food items via direct or indirect hand contact. Investigators also looked into the possibility of carbon monoxide-related illness, as the Laramie Fire Department had conducted an environmental assessment and monitored CO levels within the chapter house and among members and staff. An oven in the sorority's kitchen was found

to be emitting high levels of CO, and some illness may have been explained by elevated CO levels.

Outbreak of Acute Gastroenteritis, Natrona County

In November 2009, the Casper-Natrona County Health Department was notified of a group of coworkers who were ill after eating catered food from a local food establishment. Three ill persons reported eating a salad from the one establishment. Three other coworkers ate hamburgers and were not ill. Among those who were ill, illness onset dates range from November 4, 2009 through November 5, 2009. Attempts to interview the ill persons were unsuccessful as the plaintiffs did not return phone messages, and no laboratory samples were collected. Investigators were unable to confirm or deny that the catered food was the source of the individuals' illnesses.

Outbreak of Clostridium perfringens Toxin-Mediated Gastroenteritis Associated with Holiday Party, Laramie County

In December 2009, the WDH Infectious Disease Epidemiology Program received notification of an outbreak of gastroenteritis associated with a holiday party in Laramie County. The WDH Infectious Disease Epidemiology Program worked cooperatively with the Cheyenne-Laramie County Health Department (CLCHD) to investigate the source of the outbreak. The investigation revealed that at least 25 individuals were sickened after attending the holiday party, and that illnesses were consistent with *Clostridium perfringens* enterotoxin-mediated illness. The median incubation period was 7 hours and the median duration of illness was 17.5 hours. *Clostridium perfringens* enterotoxin A was found to be the etiologic agent that caused the outbreak via laboratory tests on human stool. The environmental health investigation revealed that several foods, including roast turkey, were temperature abused. Consumption of the roast turkey was found to be statistically associated with illness during the retrospective cohort study. The food preparer for this holiday party was not a licensed caterer, however, the food prepared did prepare the food in a licensed commercial kitchen. Inadequate knowledge of food-handling among the unlicensed food preparer was the cause of this outbreak.

Summary of Outbreaks of Acute Gastroenteritis in Long Term Care Facilities

In February 2009, a Sheridan County long term care facility reported an outbreak of viral gastroenteritis among residents and staff. A total of 7 residents and 2 staff developed symptoms of gastroenteritis between the dates of February 23 and February 26, 2009. Stool specimens were collected, but were rejected by the local hospital lab. The facility implemented recommendations for infection control provided by the WDH Infectious Disease Epidemiology Program.

In February 2009, a Laramie County long term care facility reported an outbreak of viral gastroenteritis among residents and staff. A total of 8 residents (out of 145, 5.5%) and 11 staff members developed symptoms between the dates of February 22 and February 26, 2009. The outbreak ceased on February 26, 2009. Eight residents submitted stool samples for testing. One resident was positive for both norovirus and rotavirus at a reference lab. Eight samples were negative for bacterial and viral pathogens. The facility implemented recommendations for infection control provided by the WDH Infectious Disease Epidemiology Program.

In March 2009, a Natrona County long term care facility reported an outbreak of acute viral gastroenteritis among residents and staff. Stool samples taken were positive for norovirus genogroup II. The total number of ill persons was not reported.

In March 2009, a Campbell County long term care facility reported an outbreak of acute viral gastroenteritis among residents and staff. No stool samples were collected and the total number of ill persons was not reported.

In April 2009, a Laramie County long term care facility reported an outbreak of acute viral gastroenteritis among residents and staff. Norovirus genogroup II was identified as the etiology agent causing the outbreak. The total number of ill persons was not reported.

In April 2009, a Sweetwater County long term care facility reported an outbreak of acute viral gastroenteritis among residents and staff. Norovirus genogroup II was identified as the etiology agent causing the outbreak. The total number of ill persons was not reported.

In July 2009, a Carbon County long term care facility reported an outbreak of acute viral gastroenteritis among residents and staff. No stool samples were collected for testing. The total number of ill persons was not reported.

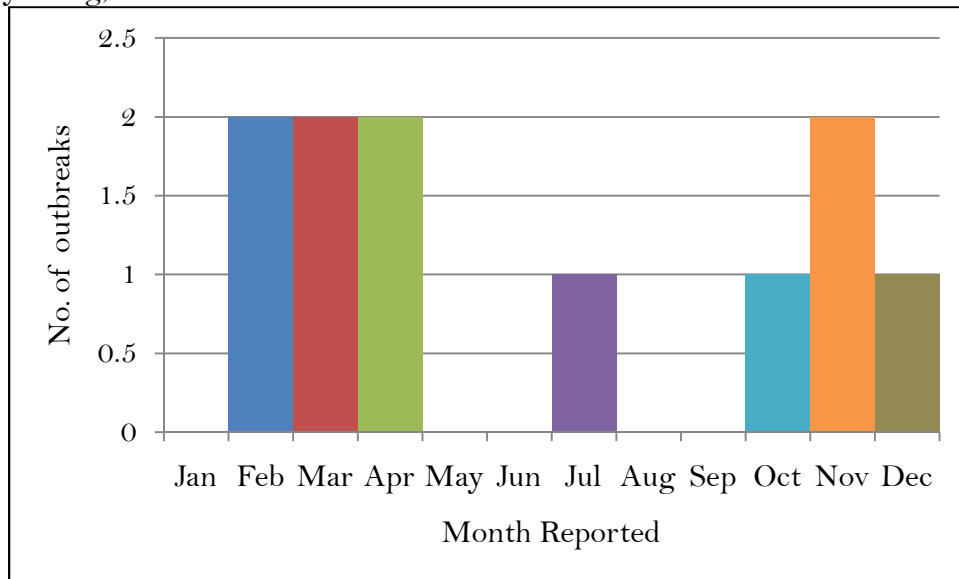
In October 2009, a Goshen County long term care facility reported an outbreak of acute viral gastroenteritis among residents and staff. No stool samples were collected for testing. The total number of ill persons was not reported.

In November 2009, a Lincoln County long term care facility reported an outbreak of acute viral gastroenteritis among residents and staff. Twenty of 24 residents (83.3%) developed illness, and seven staff were ill. No stool testing was attempted.

In November 2009, a Laramie County long term care facility reported an outbreak of acute viral gastroenteritis among residents and staff. Approximately 11 residents and 3 staff developed illness. Stool testing performed at the Wyoming Public Health Laboratory revealed two samples that were positive for norovirus genogroup II via polymerase chain reaction.

In December 2009, a Natrona County long term care facility reported an outbreak of acute viral gastroenteritis among residents. Three stool samples were tested for pathogenic bacteria and for noroviruses, and the samples were negative for both types of pathogens.

Figure 16: Occurrence of Outbreaks of Acute Gastroenteritis in Long Term Care Facilities by Month, Wyoming, 2009



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